AUTOMOTIVE INDUSTRIES

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AFL Plans New Member Drive

International Union to Be Formed at Detroit Convention Aug. 26-31

by Harold E. Gronseth
Detroit News Editor, Automotive Industries

The first constitutional convention of the United Automobile Workers, convened by the authority of the American Federation of Labor, will be held in Detroit Aug. 26 to 31. Official call went out Thursday to officers and members of federal labor unions affiliated with the A. F. of L. embracing workers in the automobile and auto parts industry.

The convention, called by direction of the executive council of the Federation, is for the purpose of forming an international union of automobile workers, of which the federal labor unions established in the automobile and parts industry will constitute the basis and will be merged into the international.

William Green, A. F. of L. president, will attend the sessions and will present delegates with charters. A constitution will be adopted and officers elected and installed. Local unions are asked to call special meetings for the purpose of electing delegates.

Representation will be on the following basis: From each federal labor union of automobile or auto parts workers with a membership of 100 or less, one delegate —one additional delegate for each additional 100 members or fractional part, based upon the per capita tax payment to the A. F. of L. for June. Each union will be entitled to one vote on a roll call vote of the convention for each 100 members or fractional part thereof, based upon the per capita tax, irrespective of the number of delegates sent to the convention. Each local is requested to submit all resolutions to the Detroit office by Aug. 20. Convention headquarters will be at the Fort Shelby Hotel.

General organizer F. J. Dillon said that between 375 and 400 delegates will attend the convention based on the membership and representation plan. There are now 170 federal labor union locals in automobile and parts plants in 14 states. Wisconsin is ex-

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G. T. Christopher
New Packard vice-president in charge of manufacturing

Bohn Would Buy All Bonneville Dam Power

Charles B. Bohn, president of Bohn Aluminum and Brass Corp., in Oregon on a survey of water power possibilities for the company's proposed aluminum manufacturing plant, said that his firm had made an offer to the government to buy the entire power output of the $40,000,000 Bonneville dam project, now under construction on the Columbia River. "The United States has our offer in black and white," he said. Mr. Bohn prophesied the output of something like 200,000,000 pounds of aluminum a year if the government would sell the company power enough. The first of the company's 10 proposed units for manufacture of aluminum is expected to cost $10,000,000.

Coast-to-Coast Road Urged

Building of a great transcontinental super-express highway from coast to coast, with feeder roads reaching out to every part of the country is once more being strongly urged on Congress and may be incorporated in the plans for the disposal of the $4,800,000,000 work relief project, according to John D. Collins, general sales manager of Tide Water Oil Co.

August May Top 200,000; New Car Stocks Lower; Used Car Stocks Up

The motor industry is approaching the end of its run on current models with a number of plants preparing for a shutdown in August. Retail demand, however, has held up so well that some are reluctant to cut off production on present lines and have deferred the wind-up by several weeks. Despite the various plant closings and curtailment, a fair sized output is in prospect for the current month. Because of the day to day nature of operations no reliable estimate can be made but such schedules as are known indicate that production this month easily could run in excess of 200,000 units.

Notwithstanding the advanced season and growing interest in new models, sales have been holding almost on a line, with the past three weeks showing only minor recessions in reports of leading companies. Strong retail demand and declining production have brought new car stocks down to an estimated 325,000 units as of the end of June, or a little more than a month's supply. Used car stocks, however, went up in June as result of the more liberal trade-in allow-

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Graduated Excess Profit Levy Proposed in House "Share-the-Wealth" Tax Bill

Estimated to produce $275,000,000 of revenue annually and expected to win an unknown number of votes at the next election, the Ways and Means Committee version of the "share-the-wealth" tax bill, proposing graduated levies on corporate incomes, heavier individual income and excess profits taxes, steep inheritance taxes, etc., was placed before the House this week.

In view of the mounting federal deficit, there is no doubt that Uncle Sam needs the money and there seems to be an equal lack of doubt in the minds of some of our elected representatives that they are going to need the votes that it is thought the bill will attract.

The minority on the Committee has been ungracious enough to point out that although the rates of taxation border on confiscation, the bill is expected to produce only $275,000,000. "This amount would pay the running expense of the government for less than two weeks and it falls $3,305,000,000 short of meeting the deficit for the last fiscal year."

Founded on the unproven economic theory that bigness is a sin, the bill provides for a graduated tax on corporate income as recommended by the President. Mr. Roosevelt suggested 10¾ to 16¾ per cent as the range of graduation, but the Committee evidently didn't think bigness was that sinful; in fact, it was indicated that while the Committee was willing to adopt the theory, it really felt that the excess profits taxes it added on its own initiative were a better way of making the burden proportionate to ability to pay. Hence the Committee limited the range to 13¼ to 14¼ per cent, as compared with the present flat 13¾ per cent, which means that no corporation will have its taxes increased or reduced by this amendment by more than ½ per cent. The 13¼ per cent rate applies to incomes not in excess of $15,000 and the 14¼ per cent to incomes of more than that amount. These new rates apply only to taxable years beginning after Dec. 31, 1935.

The present levy of 5 per cent on profits in excess of 12½ per cent on the declared value of the capital stock of a corporation, is replaced by a schedule of graduated excess profit taxes intended to produce more revenue. The 0.1 per cent levy on the declared value of capital stock, however, is retained. The new excess profits schedules apply to all earnings in excess of 8 per cent on capital stock value. Profits of 8 to 12 per cent on capital stock value will be taxed 5 per cent; 12 to 16 per cent will be taxed 10 per cent; 16 to 25 per cent will be taxed 15 per cent, and above 25 per cent 20 per cent of the excess. The capital stock value to be used in this connection is that declared under the present law and this feature has been hit on the ground that corporations should be given an opportunity to re-declare their stock value. Under the present law, corporations were told to set any value they wanted to. According to Senator Byrd, "What we are proposing to do now is to put an excess profits tax on a fictitious value . . ." These schedules apply to taxable years ending after June 30, 1936.

With an exemption of $50,000 in the case of inheritances going to close blood relatives, the new inheritance levies start at 4 per cent on less than $10,000 up to 75 per cent on $10,000,000 or more. Where payment of the tax would work undue hardship, ten years may be allowed to pay it, interest being charged meanwhile. The tax, of course, must be paid in cash and the committee apparently was little concerned with the problems involved into turning legacies which usually are not in the form of demand bank balances, into money. Gift taxes are roughly three quarters of the inheritance rates.

Individual incomes of less than $50,000 are not affected, but above this level new and higher surtaxes are proposed. Between $50,000 and $56,000, the surtax is increased from 30 to 31 per cent. On incomes over $5,000,000 the tax rate is put at 75 per cent as compared with the present rate of 59 per cent which applies to all incomes of more than $1,000,000.

The House bill was criticized by Senate Finance Committee Chairman Harrison because it did not follow the President's recommendatons on the graduated corporate income tax and because it went down to $50,000 personal incomes instead of stopping at the $1,000,000 mark suggested by Mr. Roosevelt. Senator Harrison also hit the excess profits levies.

Kelsey-Hayes Building New Foundry in Detroit

Kelsey-Hayes Wheel Corp. is constructing a steel foundry at its McGraw Ave. plant in Detroit, just below its Ford unit. The new building will have 210,000 sq. ft. of floor space and with equipment involves an expenditure of around $800,000. It will have a capacity of 250 tons daily and is to be ready for operations in August. The new plant will produce cast hubs and drums.

Older Men Favored by Oldsmobile

Summer employment will be given by Oldsmobile to men who have been with the company the longest and who are short of hours for the year, according to President C. L. McCuen who, in announcing the summer employment plan, said, "We are going to need a large number of men to do various types of work during the period in which we will be enlarging our plant for future production. Principally, we need millwrights, carpenters, electricians, plumbers, steamfitters and others trained in various construction trades. The men are being placed according to seniority, ability in the trades needed and the number of hours they have worked for the year. Loans will be made to employees during the short, summer layoff periods in amounts up to $50. No interest will be charged on these loans which are to be repaid in small installments from wages after the factory reopens."

Michigan Car Sales Register Big Gain

A total of 22,641 new passenger car titles were issued in Michigan during June, compared with 16,934 in June last year. It brought the total for the first six months of 1935 to 99,531 against 69,677 in like 1934 period. Ford accounted for 44.5 per cent of the total against 41.8 per cent a year ago. There were 2445 commercial cars titled in Michigan last month against 1845 in June last year, while the six months' total of 10,325 compared with 8669 in similar 1934 period.

Welding rear quarter and back body panels in the Ford plant at Dearborn. The welder has a capacity of 1150 sections per day

359 Dealers Lose $14.76 per New Car

First Report of NADA Survey Shows 1934 Losses on Car Sales Larger Than PAA Survey Indicated

by Don Blanchard
Editor of Automotive Industries

First data reported in the National Automobile Dealers Association survey of dealer operations in 1934 indicate that the picture presented by the earlier investigation of the Pennsylvania Automotive Association was not overdrawn.

In fact the summary of the retail car operations of 359 dealers presented in the current issue of the NADA Bulletin shows an average net loss per new car retailed of $14.76 after the absorption of used car losses. This compares with a net loss of $1.73 per new car on combined new and used car business, the average shown by the PAA survey. If the NADA results are taken as more nearly typical because they are based on reports from all over the country instead of from one state, then the average net loss per new car on retail car sales was more than $13 larger than that revealed by the PAA survey.

The NADA survey is based on 359 dealers against 255 in the PAA effort. Moreover the dealers participating in the NADA investigation averaged about 30 per cent larger than those reporting in Pennsylvania. Their average new car sales price also was about 11 per cent higher but whether this was due to a smaller number of low-priced cars in the NADA research or to the fact that they averaged further from the factory and hence had more freight to get back, cannot be determined. The latter possibility probably was the more important factor as the NADA dealers averaged just one per cent less gross margin on new cars than did the Pennsylvania dealers which is an indication at least of higher freight as transportation charges ordinarily are not marked up.

It was due this one per cent difference in discount and to about 0.7 per cent higher expenses, mainly that the NADA survey shows a higher net loss than the PAA study. However, used car gross losses also were 0.04 per cent higher. On the other hand, the PAA dealers had a somewhat higher used car volume in relation to new car sales which tended to offset their smaller gross loss.

The results of the two surveys are summarized in comparative form in the accompany tables.

As the NADA views these preliminary results, "the need for positive, effective used car control becomes very evident. Unless used car allowances can be controlled, the profit opportunity for the dealer is destroyed. It is easy to say that dealers, themselves, should control their allowances to save intact their new car profit, but any one familiar with the competitive conditions in this industry, particularly among dealers handling the same make in multiple dealer cities, knows that any control must come from the same source that establishes the new car delivered price. That source is the manufacturer. In their constant pressure for per cent of price class, for new car volume, they compel dealers to disregard good business judgment and force them to place their merchandise on the public auction block.

"Too many dealers on the one hand and too little care in the selection of dealers are factors which contribute to this deplorable situation. Both these conditions are solely within the control of the factories, and they must correct the situation before the retailing of automobiles will be a business in which there will be any assurance of profit commensurate with risk and effort."

Elsewhere in the Bulletin, the NADA says "It is only necessary for the factories to make known to their dealers that it is the 'suggested allowance' (in the NADA Official Used Car Guide) which can be maintained equally as successful as the 'suggested delivered price' of the new car, that is needed now to preserve the remaining capital of dealers. . . ."

In an editorial entitled "Some Factories Ignore Danger Signals," the Bulletin says "Despite numerous factors that point toward caution to be exercised by the automobile retailing trade in overstocking at this time, certain manufacturers, apparently blind to a critical situation in the trade, show no indication of effective recession in production. . . . Certain manufacturers . . . evidently . . . will continue . . . to force excessive new car stocks on their dealers . . . new car and truck stocks in dealers' possession as of June 1 were excessively high. . . . In the meantime production lines are kept merrily going in the annual contest to win the registration sweepstakes, and the distributive end of the business is to hold the base as usual."

In addition to the data already discussed, the NADA report also throws some light on individual expense classifications. Salaries, including salesmen's compensation, average $68; make-ready expense, $19.02; advertising, demonstration and misc. repairs to used cars, $26.26; general expense, $5.76; rent, depreciation, etc., $13.49, and taxes and insurance, $1.76, all per new car sold.

	New Car Sales		Used Car Sales		New and Used Car Sales	
	NADA	PAA	NADA	PAA	NADA	PAA
Number of units	66,260	38,568	111,334	65,261	177,594	103,829
Volume	$56,530,943	$30,075,704	$23,860,023	$13,543,794	$80,390,966	$43,619,498
Per new car	853	780	360	351	1,213	1,131
Gross profit or loss	172	165	—1	—1	171	164
Expense	124	107	62	59	186	166
Net profit or loss	48	58	—63	—60	—15	—2

(Figures reduced to nearest dollar for brevity)

	NADA	PAA
New car gross profit as per cent of new car sales	20.13	21.13
Used car gross loss as per cent of used car sales	.17	.13
Total retail gross profit as per cent of new and used car sales	14.10	14.53
Total retail expense as per cent of new and used car sales	15.31	14.68
Retail net loss as per cent of new and used car sales	—1.21	—.15

Christopher Heads Packard Production

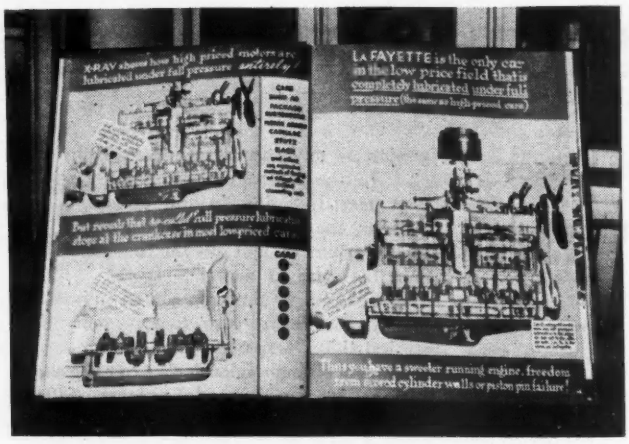
Appointment of G. T. Christopher as vice-president in charge of manufacturing of Packard Motor Car Co. is announced by Alvan Macauley, president. He succeeds R. F. Roberts, who recently resigned after 32 years' service with Packard to retire from active work. Mr. Christopher, well-known automobile manufacturing executive for the last 17 years, had been assistant vice-president in charge of manufacturing for Packard during the past year. Before this connection, he had been in charge at different times of manufacturing for Oldsmobile, Pontiac and Buick.

Reo Earns $31,544

Reo Motor Car Co. and subsidiaries report for quarter ended June 30, 1935, net profit of $31,544 after all deductions including federal taxes, and reserves for depreciation of $98,953. This compares with net loss of $234,063 in June quarter last year. For the first six months this year, net profit was $42,156, compared with net loss of $506,944 in corresponding period of 1934.

Automotive Labor Turnover Rates Per 100 Employees

	June, 1935	May, 1935	June, 1934
Quit	0.92	1.36	1.58
Discharge	0.21	0.29	0.41
Lay-off	9.47	5.53	10.80
Total separation	10.60	7.18	12.79
Accession	1.95	1.95	3.48


X-RAY shows how high priced motors are lubricated under full pressure entirely!
But reveals that so-called "full pressure lubrication" stops at the crankcase in most low-priced cars
LA FAYETTE is the only car in the low price field that is completely lubricated under full pressure (the same as high-priced cars)
This gives you a smoother running engine, freedom from scored cylinder walls or piston pin failure!

Illustrating the "X-Ray System" portfolio developed to sell the 1936 Lafayette. Phantom pictures are used to show internal operation and construction.

Car Makers Select Space at N.Y. Show

Twenty-three passenger car manufacturers and four truck producers drew for space in the New York Automobile Show to be held Nov. 2-11. The drawings took place in Detroit on Wednesday.

Chevrolet, which presumably had first choice, selected the same space it has had for a number of years while Plymouth will occupy the space used by Ford last year, as the Dearborn manufacturer will not exhibit this year. Other first floor exhibitors include Buick, Chrysler, Cadillac-LaSalle, Dodge, DeSoto, Graham-Paige, Hudson-Terraplane, Hupmobile, Nash-Lafayette, Oldsmobile, Packard, Pontiac and Studebaker.

Second floor exhibitors include Auburn, Brewster bodies, Chevrolet, Chrysler, Dusenberg, Reo, Packard, Pierce-Arrow, Studebaker and Willys-Overland. On the third floor, Chevrolet, Dodge, Reo and Willys will show commercial vehicles.

Because of the special effort that is being made to have precision machinery, demonstration devices and action exhibits at the Show, Chairman Swayne of the Show Committee believes that the exhibition will be more interesting than any previous affair.

$5 Million Loan for Budd Mfg. Approved

Stock and Debentureholders to Be Asked to Vote Assent

Approval of a $5,000,000 loan to the Edward G. Budd Manufacturing Co. under the provisions of Section 13b of the Federal Reserve Act, as amended, was announced this week.

In a letter to stockholders asking consent to approve the loan, the Budd company wrote:

"We believe that we are facing a period of business improvement, and we have booked for the next year an increased volume of automobile body business. We anticipate a growing demand for streamlined, light-weight, high-speed railroad equipment. It is consequently essential that funds be obtained for the purpose of supplying additional working capital and for the payment of certain matured and maturing obligations."

In addition to the consent of common and preferred stockholders, the consent of a substantial majority of the six per cent debentureholders will be needed to extend the maturity of their bonds from February, 1938, to February, 1941.

Upon receipt of the additional funds, the Budd company will pay in cash to each debentureholder who accepts the offer 25 per cent of the principal amount of his deposited debentures, plus accrued interest on such 25 per cent to the date of payment. The company anticipates approval of the loan by both stockholders and debentureholders because the new funds will provide additional working capital and a stronger financial position.

The $5,000,000 loan, which is payable in five years, is secured by a first mortgage on the company's real property and the pledge of certain other assets.

A meeting in order to obtain the consent of the common and preferred stockholders is being called for Oct. 31. Pending the receipt of such consent, the Federal Reserve Bank of Philadelphia, in participation with local banks, will grant the loan on a temporary basis, when approved by the debentureholders.

Rodgers Agency Merges

The J. B. Rodgers Advertising Agency, Pittsburgh, has been merged with Walker & Downing of the same city. The combination will carry on under the latter name with Mr. Rodgers a member of the staff. Mr. Rodgers is well known for his successful trade and industrial campaigns.

APEM Reports on Ind. and Ill. Wage Rates

Analyses showing wage rates paid to different classes of employees in automotive parts factories are being distributed to members by the Automotive Parts and Equipment Manufacturers, Inc. These analyses cover the states of Illinois and Indiana, and follow the general pattern set by a similar study for Michigan, the results of which were distributed last month.

The Illinois results are classified into three groups: Chicago, cities over 25,000 and cities under 25,000. In Indiana, the classification is Indianapolis, cities over 25,000 and cities under 25,000.

Automotive Profits Surge Upward in First Half

Motor Vehicle Manufacturers

	1935	1934
Auburn Automobile Co.	—$862,487	—$1,645,466
Caterpillar Tractor Co.	2,908,152	2,061,530
Checker Cab Mfg. Co.	—203,712	—221,280
Chrysler Corp.	18,659,309	8,192,084
Federal Motor Truck Co.	134,418	57,197
General Motors Corp.	83,729,838	69,586,613
Hudson Motor Co.	560,077	—*618,160
Meteor Motor Car Co.	22,930	—4,344
Nash Motors	—962,216	—1,017,089
Packard Motor Car Co.	290,460	—2,968,144
Reo Motor Car Co.	42,156	—506,944
Yellow Truck & Coach Co.	192,343	272,394
	$104,511,268	$73,188,391

*The 1935 figure is before payment of taxes. The 1934 figure is after payment of taxes.

Parts Companies

	1935	1934
Automotive Fibres, Inc.	$513,430	$448,175
Bendix Aviation Corp.	1,611,183	1,511,182
Bohn Aluminum & Brass Corp.	952,819	1,138,019
Borg-Warner Corp.	2,011,332	1,950,528
Budd Mfg. Co.	278,983	64,767
Budd Wheel Co.	516,560	148,609
Campbell, Wyant & Cannon Fdry. Co.	271,320	72,274
Eaton Mfg. Co.	1,041,960	776,556
Federal-Mogul Corp.	90,881	85,151
Gabriel Co.	—33,905	—30,298
Hayes Body Corp.	—2,936	—49,484
Houdaille-Hershey Corp.	1,773,626	725,818
Kelsey-Hayes Wheel Corp.	1,140,221	465,955
Libbey-Owens-Ford Glass Co.	4,284,316	1,751,996
Midland Steel Products Co.	653,500	293,651
Motor Products Corp.	693,105	206,323
Motor Wheel Co.	505,377	608,901
Mullins Mfg. Co.	284,124	149,307
Murray Corp.	1,202,621	*280,771
Noblitt-Sparks Industries, Inc.	243,068	140,632
Reynolds Spring Co.	246,911	169,827
Stewart-Warner Corp.	1,020,491	540,260
Young Spring & Wire Co., L. A.	1,067,585	667,550
	$20,366,572	$12,116,469

*Before taxes and subsidiary preferred dividends.

	1935	1934
Total—Vehicle and Parts Companies.	$124,877,840	$85,304,860

Willys Gets Court OK to Build Last 10,000 Cars; Creditor Group Opposes

TOLEDO, July 30—Authority for the receivers of Willys-Overland to manufacture 10,000 more cars was granted today by George P. Hahn of the Federal Court sitting at a special session in his summer camp at Harbor Springs, Mich.

He heard the objections of a small group of creditors but denied their plea for an audit and appraisal before any more operations of the plant. They asked for immediate liquidation. The creditors whose claims are said to amount to about $800,000 included the Mengel Body Co., Louisville; E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; American Rolling Mills Co., Middletown, Ohio; Collins & Aikman Corp., New York, and the City Engineering Co. and Vulcan Tool Co., Dayton, Ohio. They were represented by R. F. Young of Pickrel, Shafer, Harshman & Young of Dayton.

Judge Hahn informed the objecting creditors that considerable orderly liquidation was going on under the receivership.

He made it plain that this fifth operating order is the final one he will grant. It appears that either reorganization must be effected or liquidation will begin in earnest by the close of 1935.

Under the new order production of cars will probably get under way about the end of September. Materials and parts orders will be placed immediately. Preliminary work will begin at once in the plant. The old order was finished last week. It is expected that 3,000 men may be employed at the peak and the work may continue to Feb. 15.

Receivers represented by Bert P. Hebenstreit, attorney with Brown & Sanger, reported total cost of the receivership including operations at approximately $2,158,000 to date. It was said that maintenance cost alone without any operation would have involved an outlay of $900,000.

Fred E. Fuller, attorney for the National City Bank, trustee for bondholders, have their approval to the operating order. Bondholders will get another advance of $250,000 against their claims.

General creditors were represented by George Effler of Fraser, Effler, Shumaker & Winn.

It was reported that John N. Willys, president of the company and a receiver, who was stricken with a serious heart ailment May 4 in Louisville has been ordered back to bed in the last few days. He is expected to be an influential factor in the proposed reorganization.

Local interests indicated that it would probably require about two months to get all details of a reorganization plan developed.

Steel Institute Takes No Action on Price Complaint

The American Iron and Steel Institute is understood not to have taken any action so far on the complaint of parts manufacturers in the Toledo, Ohio, area against rates on steel which it is charged discriminated against producers in that section in favor of Detroit and nearby Michigan points. Delivered prices on steel to the Michigan points are lower than those applying to the Toledo area despite the fact that the steel moving to the Michigan points passes through Toledo. The complaint was filed on behalf of the Toledo parts makers through Clare B. Tefft, transportation commissioner of the Toledo Chamber of Commerce. A copy of the complaint was informally filed with the Federal Trade Commission. The assumption is that if the Toledo parts manufacturers are not given relief the complaint will be officially and formally filed with the FTC for action.

Hudson Has Best Half in 5 Years

Net earnings of $560,077, after depreciation and other charges, but before federal taxes, was reported by the Hudson Motor Car Co. for the six months ended June 30.

This is the largest income the company has earned in any similar period in the last five years. It compares with net loss after taxes in the corresponding period last year of $718,160.

In the second quarter profit before taxes was $325,367 as compared with $235,610 in the first quarter and $184,685 after taxes in the second quarter of last year.

Including $6,000,000 received from the sale of notes, working capital of the company has been increased more than $8,400,000 since the first of the year according to A. E. Barit, vice-president and general manager. Total working capital on June 30 was $10,610,000, of which $9,475,000 was in cash.

Hudson Renews Spicer Driveshaft Contract

Spicer Manufacturing Corp. has received a contract for the supply of propeller shafts and universal joints for Hudson Motor Car Co. requirements for 1936—the twenty-seventh consecutive year's contract between the two companies. This is believed to set a record in the industry for long-time relations between car builder and parts supplier. Ralph E. Carpenter, vice president and general manager, said the production will be handled at Pottstown, Pa., plant.

Plymouth 7 Yrs. Old

Plymouth is celebrating its seventh anniversary. During its brief history, dating back only to July, 1928, 1,155,000 cars have been produced and the car has won for itself a recognized position as one of the industry's three leaders. No small part of its success is due to the fact that at the bottom of the depression in 1933, $9,000,000 was invested in dies, tools, jigs, fixtures and machinery.

Plymouth Plans Four Additions to Plant

Plans for construction of four additions to the Detroit plant of the Plymouth Motor Corporation have been announced by company officials. The additions will give Plymouth a total of nearly 1,000,000 square feet of floor space in its Detroit plant, already the biggest building of its kind in the world. The new construction will add 103,900 square feet to the present building.

The added space afforded by the new construction at the Detroit plant will be used for storing Plymouth bodies and to increase the space available for production lines by moving such non-productive departments as factory maintenance, tool rooms, machine repairs and shop supplies into the newly built area. Five hundred bodies could be stored in one section of the new additions planned. The moving of non-productive departments into the additions will give sufficient added space on the production lines.

Completion of the new projects will give Plymouth facilities for about 2,400 cars daily in its three plants.

Alfred P. Sloan, Jr., GM president (left) and C. E. Wilson, vice-president, study the results of the No-Accident campaign sponsored by Mr. Wilson during April, May and June. The accident toll was cut from 398 to 119, a reduction of 70 per cent in 26 General Motor plants throughout the country. In 26 plants employing 6,747, there were no accidents

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Abnormally hot weather in most sections of the country did not prevent further expansion in general business last week. Most industries made a favorable showing.

The Guaranty Trust Company's index of business activity for June stood at the preliminary figure of 71.2, as against 71.4 for May and 71.6 a year ago. The Company's index of wholesale commodity prices on July 15 was 53.9, as compared with 54.5 a month earlier and 52.1 a year earlier.

Car Loadings Up

Railway freight loadings during the week ended July 20 amounted to 593,366 cars, which marks an increase of 26,878 cars above those in the preceding week, a decline of 22,674 cars below those a year ago, and a decline of 63,014 cars below those two years ago.

Food Prices Lower

Retail food prices during the two weeks ended July 2 declined 1 per cent., according to the Bureau of Labor Statistics. The current average is 21.8 per cent above that in 1913 and 11.1 per cent higher than that a year ago.

More Power Used

Production of electricity by the electric light and power industry in the United States during the week ended July 20 was 8.6 per cent above that in the corresponding period last year.

Oil Output Expands

Average daily crude oil production for the week ended July 20 amounted to 2,738,800 barrels, as against 2,715,100 barrels for the preceding week and 2,592,800 barrels for a year ago.

Coal Production

Production of bituminous coal during the week ended July 13 amounted to 4,613,000 net tons, as against 5,813,000 tons a year ago. The average daily rate of output was 50 per cent above that in the preceding week. Production of anthracite coal totaled 635,000 tons, as compared with 711,000 tons in the preceding week and 796,000 tons in the corresponding period last year.

Steel Passes 43%

Steel operations last week increased three points to 43½ per cent of capacity, and the industry regained all the ground lost since the middle of May. The increase was the third successive advance and the trade anticipates additional progress.

Wholesale Prices

Professor Fisher's index of wholesale commodity prices for the week ended July 27 stood at 82.6, as against 81.7 the week before and 81.6 two weeks before.

Gold Stocks Increase

The consolidated statement of the Federal Reserve banks for the week ended July 24 showed a decline of $1,000,000 in discounted bills, while bills bought in the open market and holdings of government securities remained unchanged. There was a decline of $34,000,000 in money in circulation, and monetary gold stocks increased $8,000,000.

Ford to Build Valve Factory at Northville

The Northville valve factory of Ford Motor Co., oldest of the so-called Ford village industries, will be replaced by a new plant, a one-story structure of steel and brick, 200 x 100 ft., with half-basement to house the power plant. It will be set in landscaped grounds near the site of the present factory, which, on completion of the new one, about the first of the year, will be dismantled and razed. Approximately 300 men will be employed, the number at present working at Northville.

The present valve factory at Northville, in which all valves used in Ford cars and trucks are made, began operations in 1920 and to date has produced more than 163,000,000 valves—50,000,000 for the V-8 type motors alone. The valves are of alloy, cast at the Rouge plant and finished at Northville.

Besides serving as a decorative feature, an artificial lake, formed by damming the River Rouge, and an overshot wheel will form part of the power equipment, but only a minor part, since the new factory will require from 1200 to 1500 kilowatts, and the River Rouge at this point has insufficient power.

Ford has six little industries along the River Rouge. The others are at Plymouth (taps and dies), Waterford (gages), Phoenix (generator cut-outs and switches), Nankin Mills (screw machine parts) and Newburg, where a new air-conditioned factory for manufacture of drills is about to begin operations.

Other factories in the Ford "little industries" chain are on the Huron River, notably the generator and starter plant at Ypsilanti, where 1000 workers are employed, and the lamp factory at Flat Rock, in which approximately the same number of employees produce all headlamps, tail-lights and domelights used in the Ford industry.

P-A Adds 9 and 15-Pass. Commercial Models

Pierce-Arrow Motor Car Co. has introduced two new commercial passenger car models, a nine-passenger commercial sedan and a 15-passenger luxury express. The 9-passenger commercial sedan is specially intended for funeral, rental, and general utility service. It is powered by the Pierce-Arrow eight-cylinder 140-hp. engine and has a wheelbase of 147 in. Sales of this unit will be handled by the regular Pierce-Arrow distributors and dealers. In addition to the regular front and rear seats, which accommodate three persons each, the car has twin auxiliary seats which are nested closely together so that they afford comfortable seating accommodation for three passengers, according to the manufacturer.

Sales of the new luxury 15-passenger express will be handled from the factory directly. The coach has a wheelbase of 204 in. To provide the additional frame stiffness required by the heavy passenger load, dual side rails are provided, an extra pair of rails extending parallel with the main side rails over about half their length, under the passenger compartment, connecting to the main side rails by spacers. The new coach is built completely in Pierce Arrow plants, including the body, and was specially designed for mass transportation over long distances at railroad speeds.

N. Y. Show Blanks Go to Exhibitors

Applications for exhibit space in the New York Automobile Show to be held November 2-9, 1935, were mailed last week to accessory and shop equipment manufacturers. The accessory exhibits will be confined to the third floor as was the case last year, and will share this area with commercial vehicle exhibits. To be considered in the first allotment, applications must be filed not later than August 12.

Realizing that many exhibitors build displays for use at various shows throughout the year, the Show Committee has decided to remove the restrictions on decoration of individual booths in the accessories section bearing in mind, however, that they should be dignified and not obstruct neighboring exhibits. There will be no restriction on reasonable electric signs.

A credential system for booth attendants will be used that will permit the workers in the exhibits to come and go at will, using a button and return check.

Prices Hold Steady as Steel Output Increases

Motor Buying Helps to Lift Operations to 44%

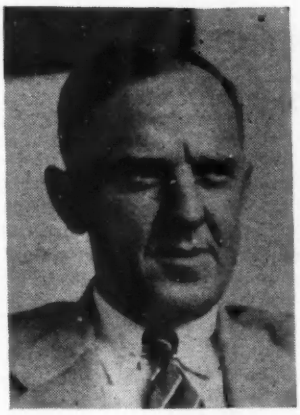
The upswing in steel market activity, all the more pronounced because of the sharp contrast with usual conditions at the beginning of August, is more or less shared in by all descriptions of steel that enter into automotive consumption. Sheet and strip specifications have broadened.

Negotiations pertaining to round tonnages with deliveries apportioned over the next two months continue independent of the demand for nearby deliveries to which going prices apply. Ordinary and cold-finished as well as alloy steel bars come in for releases that maintain mill operations at a gratifying high rate for this time of the year. Wire mills have good orders for wheel as well as upholstery wire.

Prices all along the line are well maintained, the only possible exception being minor irregularities in the jobbing market.

Mahoning valley steel mill executives state that 50,000 tons of August business from automotive consumers is in sight, either having been placed or overhanging the market. Detroit district mill operations range from 90 per cent up to capacity. Chicago district mills have also expanded their runs, orders from parts-makers making an especially good showing.

The American Iron and Steel Institute reports for this week 44 per cent of the country's ingot capacity in production, a 10 per cent gain over last week and more than 33 1/3 per cent above the year's low level a month ago. A year ago, the rate of ingot capacity engaged was 26.1 or 60 per cent of the present activity. Recently compiled figures by the American Iron and Steel Institute show that Ohio's capacity for the production of hot rolled flat steels is now approximately twice that of Pennsylvania, with the Buckeye State's cold-rolling sheet capacity five times that of the Pennsylvania aggregate.



Ernest K. Williams

Elected president and board member of the Mitchell Specialty Co., Philadelphia, succeeding the late J. J. Seitz

Grossman to Lecture on Steel Heat Treating

Dr. Marcus A. Grossman, director of research for Illinois Steel Company, will present a series of five daily lectures on "Heat Treatment of Steel," at the Seventeenth Annual National Metal Congress and Exposition to be held in Chicago the week of Sept. 30, according to announcement today by W. H. Eisenman, managing director of the show and national secretary of the American Society for Metals.

Small Loss for Studebaker; Working Capital Increases

First Report Shows Deficit After Charges of $87,837 for Mar. 9-June 30 Period

The first report of the new Studebaker Corp. shows a net loss of $87,837 after depreciation of $244,747 and interest of $166,617 for the period, March 9, 1935, to June 30 last. Net loss after charges in the second quarter was $119,511, indicating that operations in the period March 9 to 31 were conducted at a profit.

The June 30 balance sheet shows working capital of $9,325,915, an increase from the $9,183,140 indicated by the Dec. 31, 1934, *pro forma* balance sheet. Current assets totaled $14,251,984 on June 30, including cash of $6,746,298, sight drafts of $804,651, net receivables of $456,790, net inventories of $5,900,273, and other current items of $343,973. Current liabilities amounted to $4,926,070.

Sales between March 9 and June 30, 1935, amounted to $15,456,431 and in the second quarter to $12,012,779. According to Polk reports, registrations of new Studebaker cars in the United States in the first half were 21,076 against 22,900 in the same period last year. Studebaker truck registrations totaled 1005 in the first six months, as compared with 782 in the corresponding 1934 period. Total registrations of cars and trucks were 22,081 in the first half against 23,682 last year.

New Lacquer Finish Stretches Like Rubber

A lacquer coating that rivals the flexibility of live rubber has recently been developed by the Roxalin Flexible Lacquer Co., Elizabeth, N. J.

When this lacquer was applied on a piece of live rubber, the rubber was stretched to the breaking point, but the finish did not chip, or brittle off at all, it is asserted. This stretchable coating comes in a clear and aluminum color and can be applied by dip, brush or spray gun.

Pickell With Cris-Craft

Wayne S. Pickell has been appointed general sales manager of the Cris-Craft Corp., Algonac, motor boat builders. He succeeds E. S. Sabin, Jr., deceased. Formerly Mr. Pickell was associated with Packard and Cadillac.

Budd Manufacturing Co.

The Budd Manufacturing Co. has reported net earnings of $278,983 for the first six months of this year. This compares with a profit of $64,766 for the first six months of 1934.

Huge Advertising Campaign Launches LaFayette Drive on Low-Priced Market

Pointing to the fact that Nash Motors "came through the depression in one of the strongest financial positions of any independent automotive manufacturers," C. W. Nash said this week that the company is "now ready to utilize this strong position to win a place" in the low-priced field for the LaFayette.

To this end, in formally announcing the 1936 LaFayette, described in *Automotive Industries* of June 29, the company is launching one of the largest advertising campaigns in Nash history. Big space in leading consumer magazines, as well as in more than 1000 newspapers, is being used.

To emphasize the company's determination to win a place in the sun which has been shining so brightly on the low-priced market in recent years, Mr. Nash said that the company "without regard to present profits, is going to win a proportionate share of this big market on value alone. A year and a half ago we introduced our LaFayette car to sell in this price group. Since then, both the factory and our dealer organization have learned the routine of building, selling and servicing cars in the low-price bracket. Both factory and selling organization are now ready to push invasion in this car class, where more than 90 per cent of the entire American production is sold."

The LaFayette sales program includes a new method of demonstrating the features of the car, called the X-ray system. By means of photographs, the innermost parts of the car are graphically portrayed. The system also compares the LaFayette with competitive makes.

House Passes Motor Carrier Bill; President May Sign This Week

After a decade of effort, legislation regulating interstate motor truck and bus transportation is on the eve of being enacted into law. This was assured with the vote in the House Thursday on the Motor Carrier Bill as reported by the full committee on Interstate and Foreign Commerce Bill. The Bill is similar in all important respects to the Senate Bill and was supported by the American Trucking Association. Amendments adopted by the House were of a minor character. The bill went to conference immediately, and with no major differences between the Senate and House versions, the President may sign it this week.

The Interstate Commerce Commission, it is believed, will soon set up a separate division and issue rules and regulations under the new law. The House Committee on Interstate and Foreign Commerce, which had previously rejected the Huddleston substitute, mantained complete charge of the measure despite heated debate against some features of it.

Vigorous but futile effort was made by Representative Monaghan, Democrat, Montana, to incorporate an amendment for a straight 8-hour-day provision. The House, however, adopted an amendment to this amendment providing for relief from the 8-hour limitations in cases of emergency. Largely the House split along party lines, with Republicans and a small number of Democrats in opposition to the Bill.

The section relating to exemption was the object of the most important amendment. Among the amendments was one exempting "motor vehicles controlled and operated by any farmer and used in the transportation of his agricultural commodities and products thereof, or in the transportation of supplies to his farm." Exemption also was voted, except as to the hour and safety provisions, for "motor vehicles controlled by a cooperative association, as defined in the Agricultural Marketing Act."

For the purpose of making the exemption for farm and livestock haulers absolute, Representative Whittington proposed an amendment to strike out the language giving the commission power to make the Act applicable to the exempted carriers if it saw fit. Representative Pettengill, Indiana, leading the fight for the Bill, expressed agreement with the principle of the Whittington amendment. He pointed out, however, that if the amendment was adopted transportation wholly within a municipality or between contiguous municipalities, and casual, occasional or reciprocal haulers also would be made totally exempt. Because of this point, the House agreed to Mr. Pettengill's suggestion that the subsections eliminating livestock agricultural products and newspaper haulers be placed before the language giving the Commission discretionary power to make the Act applicable. Exemption also was granted to haulers of fish, including shellfish. In the section giving the Commission the right to prescribe reasonable hours and standards of equipment, the following language was added: "In the event that such requirements are established, the term 'Motor Vehicle' shall be construed to include private carriers of property by motor vehicle" in the administration of the Act. The grandfather clause for contract carriers was dated July 1, but was permitted to stand at June 1 for common carriers. The phrase "and/or water" was written into the common tariff section to require such carriers to file tariffs showing the rates between points on its own line and water lines when through rates are established. The "time effective" section of the Bill was changed to give the Commission until April 1, 1936, "to prescribe," instead of January, 1936.

Strike Shuts Thompson Piston Pin Plant

The 150 employees in the pin plant of the Thompson Products Co. walked out on strike July 25 and the plant has been shut down since then. The piston plant and valve and parts plants of the company are not affected by the strike.

The strike was called by officials of the Machinists Union and allied metal trades when two members of a union committee which was negotiating with company officials were discharged.

Company officials said a slowing up of work in the pin plant necessitated some lay offs and that the two men in question happened to be among those let out with others. They denied any discrimination against the committeemen.

"We were surprised when the plant was picketed and to avoid any disturbance we decided to close the plant," W. M. Albaugh, secretary of Thompson Products, said.

Company officials said they believe the strike can be settled without the assistance of Edward F. McGrady, ace U. S. labor mediator, who arrived in Cleveland Tuesday to try and set up a labor arbitration board along the lines of the Toledo plan.

Mr. McGrady will be called in if necessary. He will remain in Cleveland for some time to seek termination of strikes in the textile industry and one in the bakery field which has forced the closing of the 21 largest bakeries in Cleveland for six weeks.

Majority of Shippers Not for Eastman Bill

Declaring that the testimony at the hearings shows conclusively that the motor car regulatory bill is objectionable to substantially all shipping groups represented, Fred Brenckman in a letter to Chairman Rayburn of the House Commerce Commission challenges as erroneous the statement contained in the sub-committee report that the bill in its present form has the support of "the majority of shippers and many other national organizations."

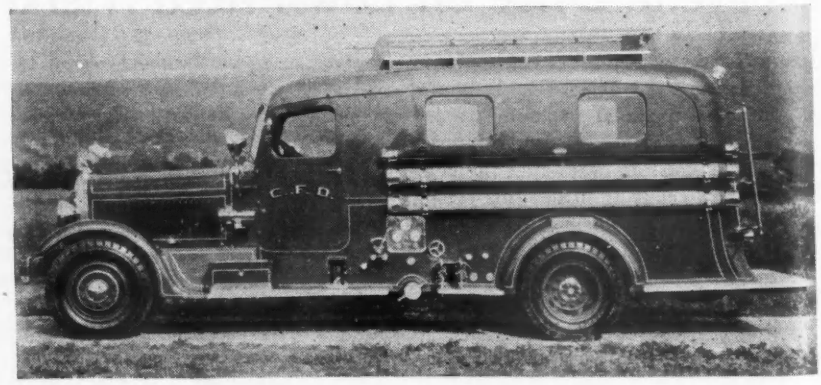
"It is a self-evident fact," Mr. Brencknam said, "that 'the majority of shippers,' burdened as they are now by excessive transportation costs, would not deliberately support a bill which would inevitably take more money from their pockets for the benefit of the railroads and the common carrier truck operators who are the principal supporters of this measure."

Perfect Circle Cuts Piston Ring Prices

Price reductions on its Type 85 oil ring, Type 70 compression ring, 80-85 piston ring sets and motor renewal kits have been announced by the Perfect Circle Co., effective Aug. 1. The 85 has been cut from 87 cents to 60 cents, while the 70 has been reduced from 46 cents to 35 cents, including the federal tax. Piston ring sets and motor renewal kits are correspondingly lower in price.

NADA Directors Voting

Directors of the NADA have been asked to vote on whether the association will give its approval to the survey of dealer operations which the Automotive Division of the Department of Commerce is planning as a work relief project.



Described as the first of its kind in the United States, this new enclosed fire truck has just been delivered to the Charlotte, N. C., fire department. It cost $12,300. The chassis is a Mack and it is fitted with a 750 gal. pump. The crew sit inside on lengthwise seats. Equipment includes 1200 ft. of hose folded under the seats, two 12-ft. ladders, nozzles, etc.

1935 Facts and Figures Published by the AMA

With many new features, the 1935 edition of *Facts and Figures* made its appearance this week and as usual the Automobile Manufacturers' Association has done an outstanding job of presenting automotive figures in interesting and readable form.

Among the new features are charts showing the seasonal pattern of used car sales for a number of years back and the distribution of 1934 used car sales by year of manufacture and the average prices at which they were sold.

Data are presented showing that 1934 new car sales exceeded cars required for replacement by the comfortable margin of 442,589, indicating many new buyers. In 1933 the margin was only 59,817, while in 1931 and 1932 sales were not as large as the number of cars going out of service.

The tendency of the public during depression to drive cars further before discarding them is indicated by the fact that the average life of an automobile is now placed at 8¼ years, as compared with 7 years just a short period back.

Taxes on motor vehicles, including license fees, gasoline levies, Federal excise taxes, personal property, city and county taxes, amounted to $1,200,107,729 last year, a new all-time record. Truck taxes last year amounted to $308,828,000, also an all-time high. It is also shown that privately operated trucks pay 2.2 times as much as passenger cars, while common-carrier trucks pay six times as much as cars.

One of six workers and one out of every six dollars of payrolls in retail and service trades come from the automotive trades which employ 1,121,745 persons. Motor vehicle factories employed an average of 273,163 factory workers and paid out in factory payrolls $371,947,239 last year, increases respectively of 44 and 59 per cent over 1933. Total employment provided by motor vehicle factories, operators, sales, servicing and road construction amounted to 4,514,726 in 1934.

An electric method of gaging piston ring grooves, developed recently, has been adopted by De Soto. The setup shown here is used to check the depth and width of four ring grooves simultaneously, flashing the information on the instrument board on the left. Colored lights give the required information as to range of limits. The gage is made by Pratt & Whitney.

GM in Production on Locomotives in November

H. L. Hamilton, president of the Electro-Motive Corporation, a General Motors subsidiary, announced July 29 that production of Diesel electric locomotives would start about Nov. 1 in the new $2,000,000 plant under construction at McCook, Ill. Between $11,000,000 and $12,000,000 production of Diesels are stated to be tentatively scheduled for the first year of operation.

Initial capacity of the plant calls for a production of from 150 to 170 units per year, with an approximate value of $22,000,000. The first year's production will probably run 50 or 60 per cent of capacity, Mr. Hamilton states, with eight or ten locomotives to build as soon as production is started in November.

It is stated that the Diesel engines will be built in the Cleveland General Motors plant. Generators and motors will be purchased from another GM subsidiary. Other parts of the locomotives will be fabricated, annealed and assembled in the McCook, Ill., plant. Three hundred and fifty men will be employed by Jan. 1, 1936.

General Motors Acceptance Corporation will extend financing service to carriers, similar to the financing of automobile purchases.

Cadillac Ad Account to MacManus, John & Adams

Cadillac-LaSalle advertising account has been given to MacManus, John and Adams effective immediately. The account will be under the personal direction of James R. Adams, vice-president of the agency. M. E. Adams and Theodore F. MacManus together have already handled the Cadillac account for 20 years at previous times, Mr. MacManus for 16 years and Mr. Adams for four, while he was with Campbell Ewald.

New Auburn Funeral Car

Auburn is adding a streamlined funeral car to its line. The rear door is in two sections hinged at top and bottom so that the junction of the doors is horizontal. Wide side doors make it easy to load flowers, etc. The wheelbase of the job is 163 in. and the load space 98 in. long.

Payrolls Lower in June

(Federal Reserve and Labor Department indexes)

	June, 1935	May, 1935	June, 1934
	Before Seasonal Adjustment		
Production	114	108	92
Employment	109	116	107
Payrolls	94	105	86
	After Seasonal Adjustment		
Production	100	86	81
Employment	103	106	101

Continental Revising Financial Setups

At a special meeting to be held Aug. 23, stockholders of Continental Motors Corp. will be asked to approve a mortgage under which a $1,000,000 loan from the RFC is to be obtained, and a change in capitalization. The present no par value stock is to be changed to $1 par and the capital reduced to $2,448,652 from $23,985,632. The balance of $21,536,980 is to be transferred to surplus against which will be written off $5,908,317 good will, $73,336 development and patent expense and the deficit as of Oct. 31, 1935.

Chevrolet Promotes Butler

E. C. Butler has been made assistant manager of the service and mechanical department of the Chevrolet Motor Co. in the Detroit headquarters under C. W. Wood, manager of the department. Mr. Butler was formerly regional service and mechanical manager at Oakland, Cal., and recently has been serving in Detroit in charge of service promotion activities.

Carborundum Acquires Hutto

The Carborundum Co., Niagara Falls, N. Y., announced this week that it has acquired the business of the Hutto Engineering Co., Inc., of Detroit. Effective this week, the business will be operated as the Hutto Machine Division of the Carborundum Co. The company continues its activities as a manufacturer of honing tools and machinery. Joseph Carlin has been appointed division manager and will continue as head of the Hutto organization.

Heffron Goes to Cleveland

Globe Steel Tubes Co. has transferred Arthur D. Heffron, Jr., from headquarters at Milwaukee to the position of manager of sales of the Cleveland district with offices in the Terminal Tower Building, Cleveland.

Automotive Excise Collections Dropped 10 Per Cent During Last Fiscal Year

Federal revenue from automotive excise taxes amounted to $277,827,108 during the last fiscal year, ended June 30. This is a drop of about 31 million dollars, or 10 per cent, from the $309,110,436 collected from similar sources during 1934.

The decrease in gasoline tax collections during the last 12 months was found to be a result of a delay in collecting 1933 taxes. During the first three months of 1934 heavy collections were made on taxes levied during the preceding six months, when the federal tax was 1½ cents a gallon.

A table, showing federal excise tax collections on automotive products during the last two fiscal years, is given below:

Source of Revenue	Amount Collected 1934 (Fiscal Year)	Amount Collected 1935 (Fiscal Year)	Per Cent of Increase or Decrease (—)
Lubricating oils	$25,254,987	$27,800,249	10.1
Gasoline	202,575,034	161,532,292	—20.2
Transportation of oil by pipe line	10,379,370	9,479,721	—8.6
Crude petroleum processed, etc.	.....	1,759,787	...
Automobile trucks	5,048,436	6,158,070	22.0
Automobiles and motorcycles	32,526,752	38,003,336	16.8
Auto parts and accessories	5,695,712	6,455,855	13.3
Tires	22,608,263	21,584,781	—4.5
Inner tubes	5,021,882	5,053,015	0.6
TOTAL (All Automotive)	$309,110,436	$277,827,108	—10.1
Per cent of all revenue collections	11.6	8.4	

New Hupp Management Increases Output, Dealers

Since the advent of the new Hupmobile management, 90 days ago, average monthly production has exceeded the average for the previous 35 months by 656 cars monthly. Factory reports indicate that within two months after the new management took office production had been doubled, the May total reaching 1552 cars, a greater number than had been turned out in any preceding single month in three years. The June output surpassed that of any corresponding month during the past four years. Export sales also showed a considerable increase, being the biggest for any June in six years. Total sales for the first half of this year exceeded 1934 sales for the January-July period.

Despite difficult conditions there has been practically no mortality among Hupmobile's long-established dealers and distributors, according to the management. A healthy and substantial growth in the dealer body has been reported. Hupp's field organzation at the present time includes 112 more dealers and eight more distributors than on January 1. The present number is the largest for 31 months.

Yellow Truck and Coach Manufacturing

Net sales of Yellow Truck & Coach Manufacturing Company for the six months ended June 30, 1935, were $16,752,352. After deducting depreciation of $456,962 and Federal income taxes of $53,795, the consolidated net profit for the first half amounted to $192,343 as compared with $272,394 for the six months ended June 30, 1934. The quarter ended June 30, 1935, showed a net profit of $432,311. This compares with a net profit of $265,079 in the second quarter of 1934.

Appoint Sterling-French

Farrel-Birmingham Company, Inc., Buffalo, announces the appointment of Sterling-French Machinery Co. as sales representatives for the Sykes Gear Generators in the Detroit territory.

Bohn to Enlarge Plant

Bohn Aluminum and Brass Corp. has asked for bids on an addition to its Plant 8, which is the extrusion division.

Canadian Show to Reveal New Vehicle Brake System

A new braking system for motor vehicles will be shown for the first time at the Canadian National Exposition opening in Toronto, Aug. 23.

While details of the design have not been revealed, it has been learned that the system will be sponsored by a new subsidiary of a well-known industrial corporation. It is understood that the corporation has established manufacturing facilities for the production of a complete line of sizes including the heaviest duty buses, trucks, and trailers.

The new brakes are said to involve a new principle in the application of hydraulic power transmission from pedal to brake shoes, and are claimed to provide several times the braking effectiveness of existing brake types, with only a fraction of the wear, without any increase in drum dimensions. The report also states that the brakes will be available to fleet operators directly for replacement installation on their vehicles, if desired.

Parker Rust Proof Co.

Parker Rust Proof Co. reports for the six months ended June 30 a net profit of $573,948 against net profit of $550,227 in first half of 1934. Net profit in the June quarter was $256,441 against $317,507 in first quarter and $269,411 in the June quarter last year. Company declared a stock dividend of 10 per cent in addition to the regular quarterly dividend of 75 cents both payable August 20 to stock of record August 10.

Allis-Chalmers Mfg. Co.

Allis-Chalmers Manufacturing Co. reports a net profit for the first half of this year of $554,955, which compares with a net loss of $822,253 for the 1934 corresponding period. For the quarter ended June 30 the company's net profit was $577,197 against a net loss of $22,242 for the second quarter last year.

CALENDAR OF COMING EVENTS

SHOWS

Machine Tool Show—Cleveland..Sept. 11-21
New York Automobile Show, New York, Nov. 2-9
Detroit Automobile Show.....Nov. 9-16
Buffalo Automobile Show .....Nov. 9-16
Newark Automobile Show.....Nov. 9-16
Cincinnati Automobile Show.....Nov. 10-16
Philadelphia Automobile Show..Nov. 11-16
Baltimore Automobile Show.....Nov. 16-23
Minneapolis Automobile Show....Nov. 16-23
Columbus Automobile Show.....Nov. 22-28
Cleveland Automobile Show.....Nov. 23-30
Montreal Automobile Show.....Nov. 23-30
Kansas City Automobile Show, Nov. 30-Dec. 6
Automotive Service Industries Show—Atlantic City .....Dec. 9-13

CONVENTIONS AND MEETINGS

American Chemical Society, San Francisco .....Aug. 19-24
S.A.E. National Production Meeting, Cleveland .....Sept. 18-19
National Industrial Advertising Association, Pittsburgh.....Sept. 18-20
American Transit Assoc., Bus Division, Atlantic City .....Sept. 23
National Assoc. Sales Finance Cos.—White Sulphur Springs.....Sept. 26-28
American Society for Metals, Annual Meeting—Chicago .....Sept. 30-Oct. 4
S.A.E. Transportation Meeting, Chicago .....Oct. 10
S.A.E. National Tractor Meeting, Chicago .....Oct. 10-11
National Safety Council, Louisville, Ky. .....October 14-18
American Gas Association — Atlantic City .....Oct. 14-18
Los Angeles .....Nov. 2- 9
S.A.E. Annual Dinner, New York....Nov. 4
Newark, N. J. .....Nov. 9-16
American Petroleum Institute — Los Angeles .....Nov. 11-14
Philadelphia .....Nov. 11-16
International Acetylene Association, Cleveland .....Nov. 12, 13, 15
Baltimore .....Nov. 16-23
National Industrial Traffic League—Chicago .....Nov. 20-21
Columbus, Ohio .....Nov. 23-28

JUST AMONG OURSELVES

$700,000 Asked for Automotive Surveys

LAST week we reported that the Automotive Division of the Department of Commerce had asked for $700,000 of the $4,000,000,000 work relief fund to make economic surveys in the automotive field.

One of the subjects to be studied is used car merchandising, and we understand that under this heading it is planned to dig into the used car problem and its effects on dealer finances. This phase of the survey, in our opinion, should not duplicate on a broader scale the PAA and NADA survey, as both of these have proved that dealer profits are close to the vanishing point.

What is needed, in our opinion, is data that will throw light on the causes of unsatisfactory profits, not further proof that dealer earnings are unsatisfactory, as that seems to be pretty generally conceded. Consequently we are hopeful that the survey of used car merchandising will develop facts that will reveal underlying causes.

* * *

Facts Should Disclose Underlying Causes

FOR a long time we have felt that one of the real causes of dealer insecurity is that in many territories the total overhead of all the dealers is out of balance with the reasonable sales potential. Under such circumstances dealers are forced to chisel to try to squeeze out enough volume to justify their overheads. Eventually some of them pass out of the picture but often new ones are appointed, throwing the situation out of balance again.

If this is the situation, and we are not alone in thinking that it is, some of this survey money might well be used in one or more territories to determine what all the overhead, all the gross profit and all the sales of all the dealers in the areas selected amounts to. We suspect that the facts would show clearly one of the important things factories must do to stabilize automobile retailing.

We suspect, but we would like to know. Here's hoping the Automotive Division, if it gets the money it has requested, spends some of it to find out.

* * *

More Miles per Hr. vs. More Miles per Gal.

THE railbirds think that the five-gallon reduction in the fuel allowance established for the 1936 Indianapolis Race is going to provide a rather tough barrier for the race car builders to get over. Speed and economy don't mix very well, and it is going to be interesting to see what can be done in the way of miles per hour in the face of the requirement of more miles per gallon.

The new limit is 37½ gal., which figures out to 13 1/3 miles per gal. Pettilo got 12.6 in winning the last race, although we understand that in 1934, when the race was slower, some of the cars showed up close to 15 miles per gal. The reduction in the fuel allowance for the 25-mile qualifying trial from 3 to 2½ gal. incidentally doesn't make the task any easier for the designer. These limits will present some nice problems in carburetor adjustment—the mixture must be rich enough to get the speed and lean enough to give the economy.

* * *

Future of Semi-Stock Engines in Doubt

JUST what the return of superchargers, barred since 1930, will mean, is conjectural. They helped a lot when the limitation was on displacement, but the fuel allowance rule makes the problem something else again. Some believe that two trends will manifest themselves—one group of designers will favor engines of somewhat near 230 cu. in. without supercharging, while another group will strive to develop smaller engines with blowers. The new rules also raise a question as to the future of semi-stock engines, with considerable opinion leaning to the view that the new rules are less favorable to them. In the effort to improve economy, it is to be expected, naturally, that compression ratios will go up, with the resulting demand for higher octane fuel.

Streamlining also appears certain to come in for more attention, with wind-tunnel testing playing a role of increased importance. Obviously anything that can be done to reduce the drag will help to meet the fuel limit.

The new rules directed at reducing accidents, of course, are all to the good.

* * *

STEWART McDONALD, one-time president of the Moon Motor Car Co., is now acting administrator of the Federal Housing Authority. He has been an assistant administrator of the same government agency since last September.—D. B.

Diesel Fuel Pumps with Speed Characteristic

by Dr. P. H. Schweitzer

Associate Professor of Engineering Research, Pennsylvania State College

THE application of Diesel engines to road vehicles directs attention to the speed-delivery characteristics of the injection apparatus. The problems involved are apparently little understood, and wrong notions on the subject are frequently encountered.

The quantity of fuel injected per cycle can be controlled in any injection pump by a lever or rod (shortly "control"), either directly by hand or by the action of a speed governor. But even with a fixed control setting the metering ordinarily changes when the pump speed changes. What are the desirable characteristics? Should the delivery increase with speed, decrease with it, or remain constant?

The answer to this question will depend on the engine and still more on the application of the engine. Only the requirements of a vehicle engine will be considered in this article.

One of the requirements is that the engine shall not smoke. Gasoline engines seldom smoke; Diesel engines always smoke when they are overloaded or when more fuel is metered than the cylinder can burn. Smoky exhaust is not only a nuisance but is ruinous to the engine. The fuel pump capacity is always considerably more than what the engine can burn with a clean exhaust. The driver does not even see the exhaust and in negotiating a hill is likely to feed too much fuel. To prevent overfeed, the control is usually provided with a stop. When the control member is up against the stop the engine should develop maximum power without smoke.

However, the maximum amount of fuel that can be burned in the cylinder with a clear exhaust varies with the speed. It depends on the volumetric and combustion efficiencies of the engine. Fig. 1 is representative of a typical engine. The heavy line shows the maximum amount of fuel that can be burned in the cylinder with a clear exhaust. It does not differ much from the torque curve. It is a declining line mainly because the volumetric efficiency of the engine becomes lower at high speed.

The amount of fuel actually delivered by the injection pump varies with the speed as shown by the dotted lines, and depends on the design of the pump. If the speed-delivery characteristic is similar to line 1 (declining characteristic), then the setting of the stops on the control is very simple. The stop may be set so that when the control rod is up against it the pump delivers, say, two-thirds its maximum capacity. If the control permits delivery of that much fuel and no more, then with the control member in the extreme (full-load) position the engine will deliver its maximum power at any speed and will never smoke.

However, if the pump has a rising characteristic (line 2), the control limit stop cannot be selected without considerable compromise. If it is so chosen that the engine will deliver its maximum power with clean exhaust at low speed, then the delivery will be excessive at high speed, and the engine will smoke. If the stop position is suitable for high speed, the engine will not smoke at any speed, but will give insufficient torque at low speed and so lack "lugging ability." A compromise is frequently made by setting the limit stop for the normal running speed, in which case the engine will fail to deliver its full torque at low speed and it will smoke slightly at the highest speed.

It is evident that the ideal speed-delivery characteristic for an injection pump is the one which with the control in the fully open position follows rather closely the limit line for clean exhaust. This, like the torque curve, is a slightly declining line, the exact shape of which varies with the engine.

But this is not all, nor even the most important requirement. The speed-delivery characteristic of the pump is no less important at intermediate or low control settings, for on it depends the stability of the engine. When the load of an unstable engine is slightly increased it slows down quickly and tends to stall. If the load is suddenly reduced it begins to race and tends to run away. A stable engine changes its speed only little at slight variations of load and there is less danger that it will stall or race. Whether a Diesel engine is stable or unstable depends primarily on the speed-delivery characteristics of

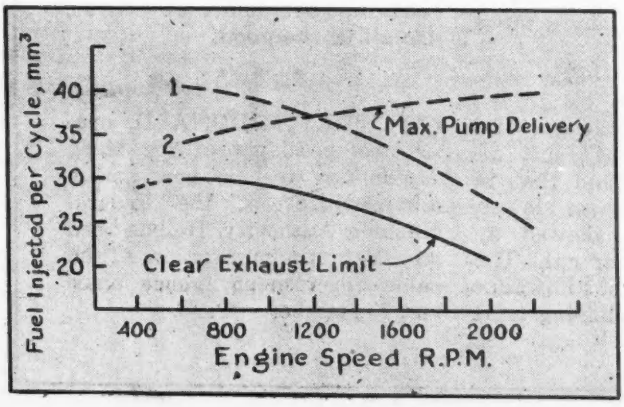


Fig. 1—Fuel that can be burned with a clean exhaust

Declining Delivery-Best in Vehicle Service

its injection pump. A rising characteristic makes an engine unstable, while a declining characteristic makes it stable.

In certain applications the nature of the load is such that engine stability is relatively unimportant. In a boat engine the torque load increases rapidly with the speed, consequently the load itself keeps the engine from racing and stalling. In generator-connected engines, sensitive governors are used that quickly adjust the control setting in the event of a sudden change in load. In a vehicle engine stability is very important, as it is not easy to keep an unstable engine from racing or stalling on the road.

Let us consider a truck engine with a pump delivery characteristic similar to line 2 on Fig. 1. On the level road the engine turns steadily at, say, 1200 r.p.m. while the operator keeps the control in a certain position. The truck then comes to a down-grade, which suddenly reduces the torque load. It gains speed, and this causes the fuel pump to deliver more fuel. The increased fuel further increases the engine speed and before the operator has time to reduce the control setting, the vehicle is racing. Inversely, if the truck happens to come to an up-grade, the increased load reduces the speed. The reduced speed reduces the fuel feed. The reduced fuel feed further reduces the speed and the engine stalls before the operator is able to adjust the control properly.

If the delivery characteristic is a declining one, similar to line 1, Fig. 1, an increase in speed will cut down the fuel feed and a drop in speed will increase it. In that case the engine tends to maintain its speed, and the operator can adjust the control more leisurely. This is a sort of self-governing feature which greatly reduces the burden on the driver. From the standpoint of stability, a rising speed-delivery characteristic is undesirable and a steeply declining characteristic (like that of the common-rail system) is most desirable. Test engineers who only test engines on the bench with a water brake or electric dynamometer often fail to realize these factors, which affect the stability of the engine on the road.

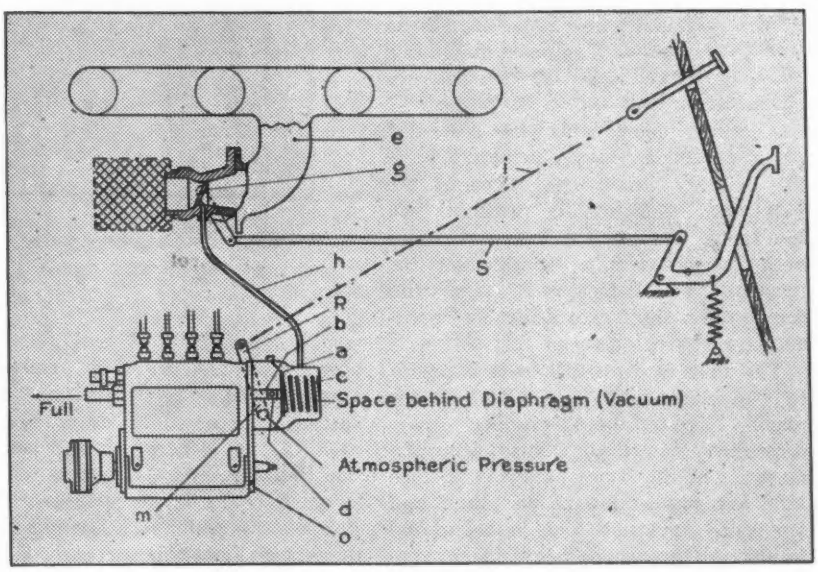


Fig. 2—Bosch pneumatic governor

Since a declining characteristic is desirable both from the standpoint of smokeless exhaust under heavy load and stable running under light load, it is unfortunate that most popular Diesel injection pumps have rising delivery characteristics. It is generally believed that port-controlled pumps have rising delivery and valve-controlled pumps a declining delivery characteristic. Why this should be so is not easy to see. The volumetric efficiency of the pump is the controlling factor. When the inlet is port-controlled, the throttling is insignificant and the volumetric efficiency can be 100 per cent or even higher. If the delivery began the moment the cut-off port closed, then the volumetric efficiency of the pump would always be 100 per cent (less allowance for the compressibility of the oil in the clearance space). However, delivery begins even a little before the final closing of the cut-off port, because when the port is very nearly closed it offers great resistance to the flow of oil through it, consequently the pressure in the pump cylinder builds up rapidly, and the delivery valve opens. Furthermore, delivery continues for a short time after the cut-off port begins to open, because the pressure is relieved only gradually, owing to the gradual opening of the port. At the higher speeds the delivery valve opens earlier, the "preflow" therefore is greater, and when cut-off occurs the higher line pressure will cause it to close more quickly, so that a greater portion of the "expansion oil" will flow through the spray nozzle. Hence, the rising speed-delivery characteristic.

If the suction is controlled by a valve, the inertia of the valve is believed to reduce the volumetric efficiency of the pump sufficiently to give a declining delivery characteristic. This explanation however does not apply to pumps in which the inlet valve is in the plunger and the inertia helps to open the valve rather than to retard it. L'Orange is of the opinion that the clearance volume in the pump has more

to do with the delivery characteristic than the manner of its fuel intake. The oil in the clearance space compresses more at high speed, when the line pressure is high, than at low speed, when the line pressure is low. It so happens that "valved" pumps have more clearance space than the compactly built port-controlled pumps. Hence the former frequently have declining speed-delivery characteristics. (The article of K. J. DeJuhasz and P. G. Burman in *The Automobile Engineer* for May, 1934, shows examples of such delivery characteristics of a Compur pump.)

Another element which has a decided effect on the delivery characteristic is the delivery valve. The shape of the valve and its throttling passages and the spring load on the valve all influence the delivery as they affect the "preflow" and "afterflow." A certain combination may give desirable speed-delivery characteristics.

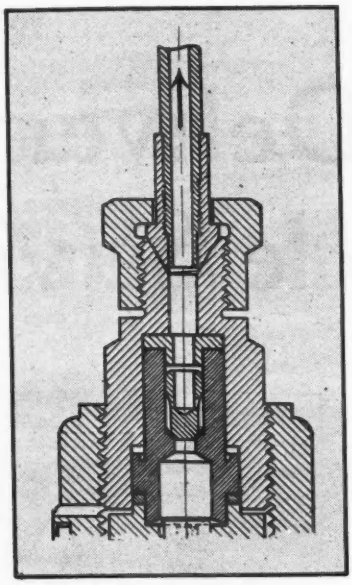


Fig. 3—Delivery valve of the Simms pump

The fact remains that the majority of the pumps now in use and on the market have unfavorable delivery characteristics. To remedy this situation the majority of the Bosch pumps sold since 1930 are provided with an idling and overspeed governor. This is calculated to prevent the vehicle engine from racing and stalling but adds nothing to its stability at intermediate speeds. Recently the German Bosch Company introduced a pneumatic governor, the principle of which is illustrated in Fig. 2. The engine air intake duct is provided with a butterfly throttle which creates a partial vacuum in the manifold. The higher the engine speed, the higher the vacuum. However, even the highest vacuum may be so low that it would not affect the air charge of the engine appreciably. This vacuum is carried through pipe *h* to the back side of diaphragm *a*. The diaphragm is attached to the control rack of the pump. When the operator presses on the accelerator pedal, the butterfly valve opens and the negative pressure on diaphragm *a* is reduced. Consequently, spring *c* presses the diaphragm and rack to the left, which increases the fuel delivery, and the vehicle will gain in speed. If the driver releases the pressure on the pedal, the vacuum behind the diaphragm will increase, the fuel feed will decrease and the vehicle will lose speed. Now suppose the driver keeps the pedal steady in a certain position, but the vehicle comes to an uphill stretch and loses speed. The direct-coupled engine will also lose speed, and the manifold vacuum will decrease. Diaphragm *a* will move toward the right and the rack will feed more fuel. This will tend to counteract the loss of speed due to the change in grade, supplying the much-needed stability. The pull button with rod *i* provides a direct control in addition to the indirect control.

The same result can be accomplished by means of a centrifugal governor controlled from the driver's seat.

A governor, however, may be considered an undesirable complication on a motor vehicle which, in any case, is under the continuous control of the operator. To those who feel that way, the Bosch company now offers injection pumps with improved delivery characteristics. With an increased and properly selected spring load on the delivery valve it is claimed that rising, declining or constant delivery characteristics can be produced according to the requirement of the engine.

Another device which aims to correct the delivery characteristics of the fuel pump is the Henschel M. E. P. control. A restricted orifice is placed in the injection line which causes the pressure to build up higher at high speeds than at low speeds. A by-pass valve opens in the line whenever the pressure exceeds a predetermind value and permits some of the oil to return to the supply chamber. The result is a declining speed-delivery characteristic.

The British Simms injection pump, which is being manufactured under license from L'Orange, is claimed to possess the same advantage by reason of a restriction on the flow through its delivery valve. In an ordinary delivery valve the flow area is a minimum at the valve seat. By placing the throttling section at a point above the seat in the valve body, as shown in Fig. 3, the throttling effect is made independent of the valve lift. The lift of the valve can then be so changed that even at high pump speeds there will be time for a certain amount of fuel to return before the delivery valve closes following the cut-off.

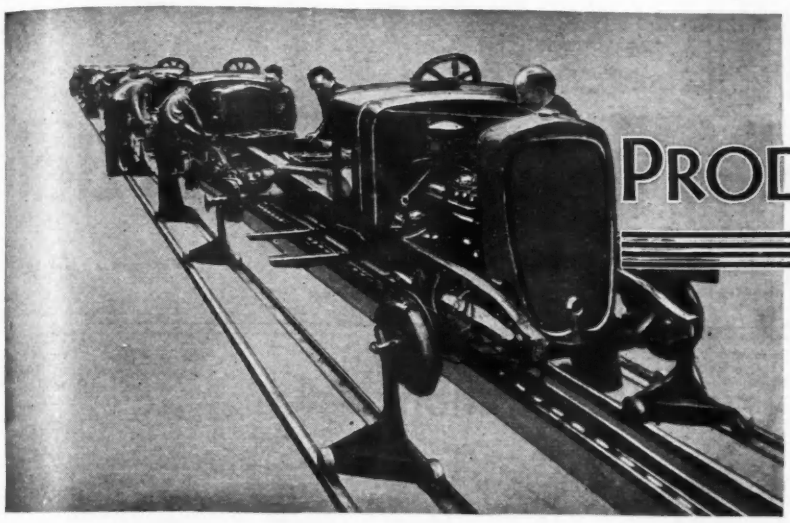
With the solutions described and others that may be offered in the near future, there is little doubt that the speed-delivery characteristics problem will soon cease to cause difficulties in connection with automotive applications of the Diesel engine.

Mechanism of Chromium Deposition from the Chromic-Acid Bath

CHROMIUM is deposited commercially from baths composed principally of chromic acid, in which the chromium is sexivalent. After use, such baths always contain some trivalent chromium, and many of the proposed theories of this process postulate that the chromium is deposited from the trivalent (or possibly bivalent) state, for which the chromic acid serves as a reservoir.

In the *Journal of Research* for June evidence is presented to show that chromium is deposited directly from the sexivalent state. The principal evidence is the fact that relatively large additions of compounds of metals such as zinc, nickel, cadmium, iron, and copper have no such effects upon the behavior of the chromic-acid bath as would be expected if deposition occurred from the trivalent state. It is shown by cryoscopic and spectrophotometric data that the dichromates of these metals are strongly ionized.

The low efficiency and high polarization in chromium deposition are accounted for, and certain paradoxes are explained in this paper. Although possible directions for improvement are pointed out, none seem practicable.



PRODUCTION LINES

Case Book

"Facts about Metal Cutting" is an interesting little booklet on cutting oils just received from Socony-Vacuum. It's really a series of case studies in which a separate sheet is devoted to each type of metal, describing the set-up and giving the actual results. This is quite out of the ordinary run of material and may help you to check your own practice against the shop results reported. Ask us for a copy.

New Piston

Other car companies are investigating the light, iron alloy piston which we mentioned recently as being tried out experimentally by one of the leading producers. This company, incidentally, has been shipping about 50 cars a day with complete sets of special pistons. The cars are going to dealers all over the country and are under close scrutiny. Indications are that this is going to be a definite trend in certain quarters if the trial period is hurdled successfully.

Iron Cranks

The talk is that camshafts and cranks of alloy iron are being considered seriously by a number of car builders. Some cars may break out with iron camshafts as a starter. Campbell, Wyant, and Cannon is probably one of the biggest factor in this development.

On All Fours

Just came back from a ride in a popular priced car which has been fitted with a new system of independent springing on all wheels. We took it over a terrible dirt road full of pot holes, on the outskirts of Motor City, and it certainly took the punishment without a whimper. This design uses a single transverse spring front and rear, in combination with a large diameter coil spring at the center of each leaf spring. Spring assemblies are tilted about 30 deg. with the vertical axis. Radius rods front and rear, in combination with stabilizer bars. An oil type shock absorber is mounted inside of the coil springs producing a single point mounting at each end.

Thixotropy

Are you up on your thixotropy? *Industrial Bulletin,* No. 98 quotes a paper by J. Pryce-Jones of London in which this property is discussed. The term refers to a reversible process in emulsions whereby colloidal or gelatinous systems may, by shaking or stirring, or other mechanical means such as agitation by powerful sound waves, be transformed from a more or less solid jelly to a plastic or even fluid state. It returns to the solid condition after a period of rest. Conversion of rubber latex solution into the thixotropic state presents added possibilities for efficient utilization.

Synthetic Finish

At the new Dodge truck plant the entire paint shop facilities for bodies and sheet metal have been designed for synthetic enamel. Careful metal finish, painstaking attention to undercoats and conditioning of the spray booth and oven atmosphere produce a very handsome finish.

Light Metal

If you want to take a peek at the laboratories of the Dow Chemical works get a copy of the bulletin, "Chemical Progress," just off the press. It discusses applications as well, but we think you'll want to compare notes on what they are doing.

By Light

A timely bulletin on J & L comparators has just come across our desk. It describes applications of bench and pedestal comparators and also gives some notes on special attachments that are available. Some idea of the range of sizes and forms of parts that have been inspected by comparator methods may be gained from a group photo on page 22 of the bulletin. This looks like a very practical piece of technical literature.

Nomenclature

Accepted descriptive names for various chassis parts are giving publicity men and specifications writers a lot of trouble. The gist of the matter is that engineering changes have outstripped the conventional nomenclature adopted by the SAE many years ago. We refer to front drive, rear drive, semi-automatic transmissions, independent springing, and many other things that are on the way. Some one ought to lighten these fellows' burdens by adding to the language of engineering.

Way Back

Talked to a real old timer whose experiences in interchangeable manufacture indicate that mechanical ingenuity is by no means a product of our present generation. Many years ago he was running a big plant and had to hold costs down to the bitter penny, or rather fraction of a penny. One job in particular involved a part that required the stamping of a serial number. What he did was smart. He fitted the numbers into vise jaws and when the piece was clamped for a machining operation the serial number was impressed without an extra operation. Besides, the numbers acted as a key to hold the piece rigidly in place. —J. G.

MANUFACTURING MANAGEMENT METALLURGY

Car Sales Up 26%, Trucks

New Truck Registrations

	June, 1935	May, 1935	June, 1934	Six Months 1935	Six Months 1934	Per Cent Change 6 Mos., 1935 over 1934	Numerical Change 6 Mos., 1935 over 1934	Per Cent of Total Six Months 1935	Per Cent of Total Six Months 1934
Ford	17,385	17,591	12,205	97,314	61,503	+58.1	35,811	38.30	31.58
Chevrolet	17,576	16,284	12,981	84,196	76,916	+9.5	7,280	33.14	39.50
Dodge	4,911	5,381	3,729	28,696	21,995	+30.6	6,701	11.28	11.29
International	4,710	4,807	2,435	24,431	15,288	+59.3	9,143	9.62	7.85
G.M.C.	901	883	884	4,932	4,479	+10.0	453	1.94	2.30
Diamond T	572	570	481	3,293	2,850	+13.8	443	1.30	1.46
Reo	439	616	504	2,565	2,698	—4.0	—133	1.01	1.39
White	220	267	404	1,501	2,292	—34.5	—791	.59	1.18
Studebaker	218	229	133	1,005	782	+28.0	223	.40	.40
Federal	178	193	196	945	971	—2.7	—26	.37	.50
Willys-Overland	266	224	1	858	13	....	845	.34	.01
Mack	103	189	154	728	1,022	—28.8	—294	.28	.52
Brockway	113	97	108	526	618	—14.8	—92	.21	.32
Autocar	73	78	95	398	530	—25.0	—132	.16	.27
Terraplane	108	72	72	348	201	+73.0	147	.14	.10
Stewart	69	60	67	327	448	—27.0	—121	.13	.23
Henney	13	17	22	228	99	+130.0	129	.09	.05
Plymouth	87	54	15	175	57	+207.0	118	.07	.03
Austin	13	17	22	143	372	—61.6	—229	.06	.19
Divco	40	47	19	146	113	+29.3	33	.06	.06
Indiana	38	27	43	143	350	—59.1	—207	.06	.18
Buick	5	14	10	102	74	+38.0	28	.04	.04
F.W.D.	8	15	10	97	64	+51.5	33	.04	.03
Miscellaneous	155	197	189	966	1,009	—3.4	—43	.37	.52
Total	48,243	47,968	34,778	254,063	194,744	+30.7	59,319	100.00	100.00

Truck Production by Capacities

(U. S. and Canada)

Six Months 1935 and 1934 Compared

	1935	1934	Per Cent Change	Per Cent of Total 1935	Per Cent of Total 1934
1½ tons and less	387,676	301,898	+28.6	94.41	92.31
2 to 3 tons	17,629	21,294	—17.3	4.29	6.51
3½ tons and over	3,314	2,817	+17.6	.81	.86
Special and buses	2,026	1,053	+92.2	.49	.32
Total	410,645	327,062	+25.3	100.00	100.00

31%, in First Half of 1935

New Passenger Car Registrations

	June, 1935	May, 1934	June, 1934	Six Months 1935	Six Months 1934	Per Cent Change 6 Mos., 1935 over 1934	Numerical Change 6 Mos., 1935 over 1934	Per Cent of Total Six Months 1935	Per Cent of Total Six Months 1934
Ford	83,273	93,467	64,405	488,468	295,280	+65.8	193,188	33.41	29.66
Chevrolet	66,054	59,209	64,580	312,164	268,746	+16.0	43,418	21.35	26.99
Plymouth	40,263	43,713	34,118	213,057	158,985	+34.0	54,072	14.57	15.97
Dodge	18,693	20,092	9,220	96,923	49,412	+96.1	47,511	6.63	4.96
Oldsmobile	16,421	17,930	9,190	80,440	34,345	+134.0	46,095	5.50	3.45
Pontiac	14,978	16,058	9,031	45,124	41,708	+80.0	33,416	5.14	4.19
Buick	6,758	7,082	8,309	34,076	30,977	+9.9	3,099	2.33	3.11
Terraplane	5,704	6,113	4,663	28,841	22,675	+27.1	6,166	1.97	2.28
Chrysler	4,778	5,217	3,228	24,052	13,054	+84.9	10,998	1.65	1.31
Studebaker	3,966	4,479	5,233	21,076	22,900	—8.2	—1,824	1.44	2.30
DeSoto	2,917	2,957	1,146	14,260	5,634	+153.0	8,626	.98	.57
Packard	4,313	3,964	582	13,220	2,806	+372.0	10,414	.90	.28
Hudson	2,192	2,486	1,998	11,647	10,982	+6.2	665	.80	1.10
Nash	2,144	1,593	1,343	8,333	8,414	—1.0	—81	.57	.85
Graham	1,728	1,838	1,291	8,276	6,931	+19.3	1,345	.57	.70
LaFayette	1,264	1,684	1,361	7,742	2,787	+178.0	4,955	.53	.28
LaSalle	1,403	1,593	762	5,648	2,760	+104.0	2,888	.39	.28
Willys	1,062	981	780	4,873	3,203	+52.3	1,670	.33	.32
Hupmobile	724	877	670	4,335	2,707	+60.3	1,628	.30	.27
Auburn	495	561	477	3,011	2,300	+31.0	711	.21	.23
Cadillac	529	549	499	2,665	2,935	—9.2	—270	.18	.29
Reo	411	418	466	1,979	1,898	+4.3	81	.13	.19
Lincoln	159	213	175	934	1,061	—11.8	—127	.06	.11
Pierce-Arrow	80	75	193	378	934	—59.5	—556	.03	.09
Miscellaneous	51	52	144	418	2,121	—80.3	—1,703	.03	.22
Total	280,360	293,201	223,864	1,461,940	995,555	+47.0	466,385	100.00	100.00
Chrysler Corp.	66,651	71,979	47,712	348,292	227,085	+53.4	121,207	23.83	22.81
Ford and Lincoln	83,432	93,680	64,580	489,402	296,341	+65.1	193,061	33.47	29.77
General Motors	106,143	102,421	92,371	510,117	381,471	+34.0	128,646	34.89	38.32
All Others	24,134	25,121	19,201	114,129	90,658	+25.9	23,471	7.81	9.10

Passenger Car Production by Wholesale Price Classes

(U. S. and Canada)

Six Months 1935 and 1934 Compared

	1935	1934	Per Cent Change	Per Cent of Total 1935	Per Cent of Total 1934
$500 and under	1,186,742	937,716	+27.7	60.47	63.83
$501-$750	700,607	452,053	+55.0	35.69	30.77
$751-$1,000	53,663	47,749	+12.3	2.73	3.25
$1,001-$1,500	12,717	20,643	—38.3	.65	1.40
$1,501-$2,000	4,747	5,205	— 9.0	.24	.35
$2,001-$3,000	2,698	4,469	—39.6	.14	.30
$3,001 and over	1,645	1,450	+13.5	.08	.10
Total	1,962,819	1,469,285	+33.8	100.00	100.00

The Forum

Shorter Engines for Streamline Cars

Editor, AUTOMOTIVE INDUSTRIES:

Reduction of air resistance, usually called "streamlining," is becoming a more and more serious consideration in automotive design. With the engines located in front, the sloping of the rears of the bodies necessitates placing the engines farther forward, unless shorter ones of some sort are used in place of those used generally at present. Arguments of "new and scientific weight distribution are frequently made by manufacturers, but, after they get all through with their arguments, the fact remains that their cars are becoming more difficult to handle on turns and harder on their front tires as a result of moving the weight of the engines and bodies farther ahead. The design of racing cars is sufficient evidence of the value of locating the engine well back in the front of a car. Did anyone ever see a successful track or road racing car with its engine located so far ahead as has become the general thing in American cars made for general road use?

Looking forward a few years, when better and more high-speed highways will be constructed, cars will be much more streamlined than they are now, and the tendency, so long as the present types of engines and front engine location are retained, will be to move the engines still farther forward. There is a practical limit to this, and the designers of future cars will have a problem of proper weight distribution to solve that will be serious.

If the radical change of locating the engines at the rear is made, and if engines of the usual types are used (unless they are placed crosswise of the cars), the result is too much overhang of weight and length behind the rear axle.

Whether engines are to be located in front or behind, the desirability of shorter ones than those in general use at present is obvious.

The radial engine has been suggested as solving the problem of engine type. However, the usual type of radial engine is not well suited to car use. It is difficult to mount in a car frame, and its downwardly projecting cylinders result in a high center of gravity and inaccessibility. Its crankcase has no pan or sump, and just how satisfactory its lubrication system would be in such use is questionable.

There has been developed, however, a type of radial engine that seems interesting. The fan-shaped engine made in France some 23 years ago for airplanes by Robert Esnault Pelterie, known as the R. E. P. type, would have no such disadvantages. It was made with five, and, as I remember it, with seven cylinders. It had a two-throw crankshaft with cranks at 180 deg. Its cylinders were in two relatively offset rows, its connecting rods, in the five-cylinder engine, acting three on one crank and two on the other, and, in the seven-cylinder engine, four on one crank and three on the other. Looking at either engine from in front or behind, the cylinders of one row appeared to be between those of the other row. Due to the locations of its cylinders and its type of crankshaft, equal intervals between its explosions in crankshaft rotation resulted.

If an engine of such type can be satisfactorily balanced, is it not more appropriate for car use than the radial type having all of its cylinders in a single row around its crankcase and all of its connecting rods acting on a single crank? It is of interest that adoption of the radial type engine readily allows the elimination of plain crankshaft main bearings, as ball or roller bearings can easily be used. It is possible that the radial engine may cause a revival of air cooling, as such cooling renders unnecessary the peculiar system of water tubing that a water-cooled radial engine would require to effect equal water flow to all cylinders.

STANLEY B. ARNOLD,
San Diego, Calif.

The DeDion Bouton Had It

Editor, AUTOMOTIVE INDUSTRIES.

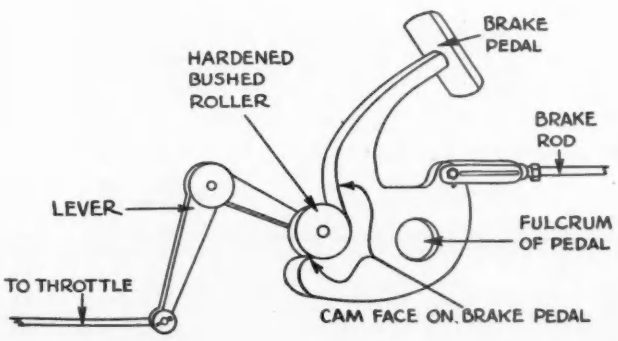
Re hook-up of brake and throttle, Vol. 72, No. 25, page 825, June 22, 1935.

I am surprised no one has revived this idea in this day of high speeds. This system was successfully used and excellently made for years by DeDion Bouton & Cie on all their gasoline cars, trucks and buses. The sketch shows the combination and would have fitted the system to my Packard but other members of the family use it and it may be awkward changing over temporarily to another car.

W. JOLLEY.

Editor, AUTOMOTIVE INDUSTRIES.

In the June 22 issue of *Automotive Industries* I noticed with interest D. B.'s reference to the inter-connection between throttle and brake controls. I am wondering if D. B. remembers some of the old DeDion Bouton's of



many years ago on which one pedal controlled both brake and throttle.

In the completely depressed position the brake was on full. As the pedal was allowed to rise the brake application diminished until it became zero, and upon a further letting up of the pedal acted to open the throttle, which, with the foot off the pedal entirely, was in full opening. HORACE C. HALE.

Editor's Note—While D. B. remembers there was a DeDion Bouton, unfortunately his automotive memory is not good enough to recall any of its detail. However, in mentioning one control for brake and throttle, he had no idea of advancing a new idea but simply of suggesting something that he thought desirable.

Signaling by Positioning the Car

Editor, AUTOMOTIVE INDUSTRIES.

I am much interested in Mr. P. J. Fleming's little article on "Driver Signals," which appeared on Page 791 of the June 15 issue of *Automotive Industries.*

I think Mr. Fleming's remarks regarding hand signals are excellent and very much to the point and undoubtedly some of the wild turns we see made at corners are due to people trying to signal and turn at the same time. However, I am not in agreement with him that the solution to the problem is to standardize on a mechanical signal. Instead, I question whether 99 per cent of the hand signaling in vogue today in connection with the operation of passenger cars makes for safer operation, or is neecssary.

This may sound like rank heresy but let us really watch what goes on, on the highways. I believe that centering the driving public's attention on hand signaling is at the bottom of making many of the public most serenely careless and -quite without thought about the position of their cars on the highways; about suddenly changing their positions and I think is largely responsible for developing a nation of drivers who do a lot of miscellaneous arm waving and are "all over the road"; each secure in the conviction that because he has waved his arm he has the right of way, no matter where on the road and what the impending traffic situation may be. They don't even take the trouble to look, they hand signal and let the car go.

After having run down hand signaling in this rather positive manner, you may ask, have I any solution to offer. Yes, I have. Please watch your so-called "Super No-Accident Driver." What does he do? He hand signals about 1 per cent of the time but he always signals by position of his car on the road. You can signal your intentions by the position of your car on the road. It works 24 hours a day and with a signal of car size. It causes the least interruption to traffic and as such shows consideration and courtesy to others using the highway. It permits using both hands on the steering wheel and with the least distraction to you, the operator.

At right hand turns the courtesy of getting well over to the right side of the road so that traffic can pass on your left; and on left hand turns, the courtesy of getting well up in the middle of the road so that traffic can pass on your right, makes for safety.

In other words, position of the car on the road is the all important feature of safe and sane driving, not signaling by hand, arm or mechanical device. If you are in the right position, you're safe. If you signal but are in the wrong position, you're not safe, though probably lulled into believing you are safe.

Therefore, it seems psychologically wrong to discuss, agitate and urge hand or mechanical signaling so that it occupies the mind of the driving public to the very apparent exclusion of thinking in terms of being in safe position on the highways at all times. If the police and other highway safety agencies would stress and emphasize and direct their efforts toward teaching people correct and safe position of car on the road and not permit the substitution of hand signaling for correct car position, out of it will come a greater degree of all-around safety on our highways and a greater degree of road courtesy—and it can be taught! Look at the healthy respect motorists have for fire hydrants.

J. W. LORD,
Safety Engineer, Atlantic Refining Co.

Editor, AUTOMOTIVE INDUSTRIES.

I agree with Mr. T. J. Fleming (Aut. Ind. June 15, 1935) that with closed cars it is difficult to give arm and hand signals for turns, and that such signals are not reliable. I do not agree, however, that it is necessary to compel drivers to adapt mechanical signals.

In driving through New York traffic and in the surrounding states since 1929, when I bought my first closed car, I have never used my arm or hand for signaling (except when it is necessary to ask traffic officer's permission for a turn), and I have found that the majority of good drivers never signal by their arms and do not expect the other drivers to signal. It is a simple matter to announce one's intention of turning by coming at a reduced speed to the turning point in a proper lane. A glance into the mirror at the last moment is often useful (I have an extra mirror at the side). In a heavy traffic one easily finds out that the arm signal will not help much if one wishes to make a turn from a wrong lane. In this connection it should be mentioned that under certain conditions it is perfectly proper to pass cars on the right side and it should not be prohibited.

JOHN P. NIKONOW.

European Racing History

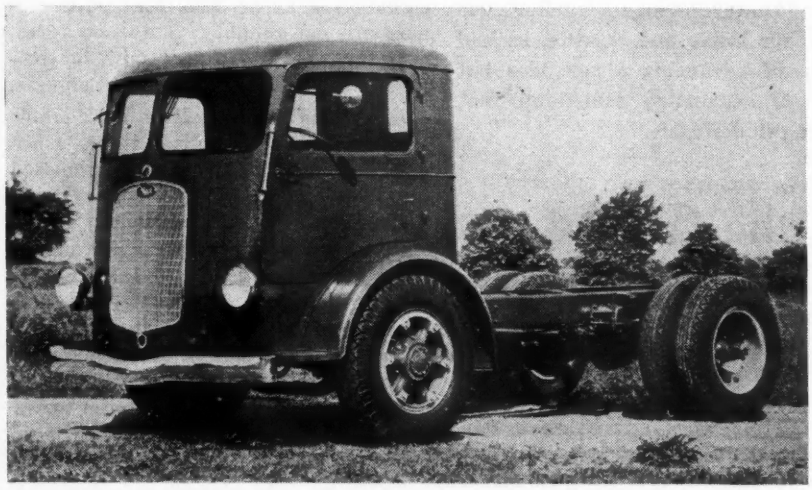
Editor, AUTOMOTIVE INDUSTRIES.

May I take the liberty of correcting your Paris correspondent Mr. Bradley? Luigi Archangeli was killed while practicing for the 1931 Italian Grand Prix on Monza track at the wheel of a twelve cylinder Alfa Romeo. This car had two 1750 c.c. motors with two separate driveshafts and was driven in the race a few days later by Tazio Nuvolari, but failed to finish.

Undoubtedly Mr. Bradley had in mind the crash of Ruggeri on the sixteen cylinder Maserati while practicing for an attempt on the Hour Record at Montlery in 1932. To my knowledge Maserati never built a twelve cylinder racer.

E. E. WATERHOUSE.

New Traffic Type Macks



An integral all-metal roof is one of the features of the cabs on the new traffic-type Macks

A MODERNLY styled "streamlined" coupe cab with integral all-metal roof features the improved Mack cab-over-engine truck models, the CH and CJ. By a new "roll-out" feature the powerplant can be removed as a unit through the front of the cab, for repairs or overhauls. The new trucks also have shorter wheelbases for a given platform length, this reduction in length having been made possible by moving the front axle farther back.

The new cabs present a sloping front sheet and windshield, which together with a smooth radiator grille, blends harmoniously with the streamline body types. The roof, which is of all-metal construction, is built integral with the cab, a feature that parallels a late trend in passenger car bodies.

Doors are wide and hinged at the rear. A step is located at the front of the fender at bumper height, and in addition there is a step tread atop the fender. There are chromium-plated grab rails adjacent to the door handles. The windshield is divided vertically into two sections arranged in a shallow V and slanted to prevent reflection. Each section is hinged at the top and can be opened independently of the other.

The driver's seat is adjustable. Seats and back cushions have deep springs, with rubberized as well as interlaced curled hair pads, and are covered with genuine leather. Back cushions are of the high-back, inclined type. In addition to the ventilating windshields and the drop windows in the doors, the front sheet is fitted with two door-type hatch ventilators, located on opposite sides of the radiator grille. There are two screened ventilators also over the top of the windshield frame, and two fixed back windows in the cab, which, being located close to the sides, provide maximum rear vision.

The instrument board carries clock-type instruments and is illuminated by indirect lighting. Besides the usual instruments, the board is fitted with a combination gasoline and crankcase-oil level gage. Other items of cab equipment include automatic windshield wipers, rear-view mirrors, a dome light and coat hooks.

The "roll-out" feature permits withdrawing the engine, clutch, transmission and radiator as a unit. The powerplant is mounted on a subframe which can be rolled out through the front of the truck on its own rollers, so that the removal or replacement of the powerplant can be accomplished by one man in about an hour and a half. The subframe has four rollers which are disposed within the channel of the main frame side members, upon which it rolls when being pulled out or pushed into position. When the powerplant is in position the subframe is rigidly locked to the main frame by twelve large bolts, and is pulled into position by two heavy screw-jacks, one on each side. To withdraw the powerplant it is only necessary to remove the radiator grille and bumper, lift the engine inclosure within the cab, and disconnect the powerplant. All electrical connections are broken with one motion through a multiple connector and socket located under the instrument board.

All units are said to be readily accessible for routine adjustments and minor repairs. Located between the floorboard and the seats, the engine is covered by an aluminum double-shell housing, heavily insulated on the inside. This housing seats in a felt-filled channel which is claimed to render it heat-tight, acoustically dead, and gas-proof. This inclosure is in two parts, the main housing being hinged at the upper rear edge, the smaller fitted against the front sheet. The main housing may be raised and held back against the back of the cab, thus providing access to the spark plugs, distributor, generator, oil filter and valve tappets. Toggle hood latches hold the housing tight. The rear of the engine inclosure terminates in a grille in the lower part of the back of the cab, through which a part of the radiator air escapes. The seats are so

Feature "Roll-Out" Power Plant

arranged that they can be folded flat against the back of the cab, or removed. When the seat is removed it exposes the battery under it. The latter is mounted in a steel box, ventilated from below, and has outside binding posts. Removal of the seat also permits the easy removal of the floorboard under the helper's seat, for access to the valves, carburetor, manifolds, etc.

Wheelbases are 6 in. shorter than in previous Traffic-Type Macks, for the same platform lengths. The distance from the front axle to the back of the cab is now 24 in., as compared with 30 in. previously. While retaining a gross weight distribution of one-third front, two-thirds rear, these chassis have shorter turning radii and shorter overall lengths, due to the shorter wheelbases.

Mechanical details of the trucks remain unchanged, the CH being powered by the Mack 4 by 5½-in., 108 hp. engine, the CJ by the 4¼ by 5½-in., 118 hp. Drive from the single-plate, dry clutch is through a four-speed selective sliding gear transmission and a two-part drive shaft with four universal joints to the dual reduction rear axle. Springs are connected with the frame through rubber shock insulators.

New 3850-Gal. Tank Combination Weighs 13,450 Lb.

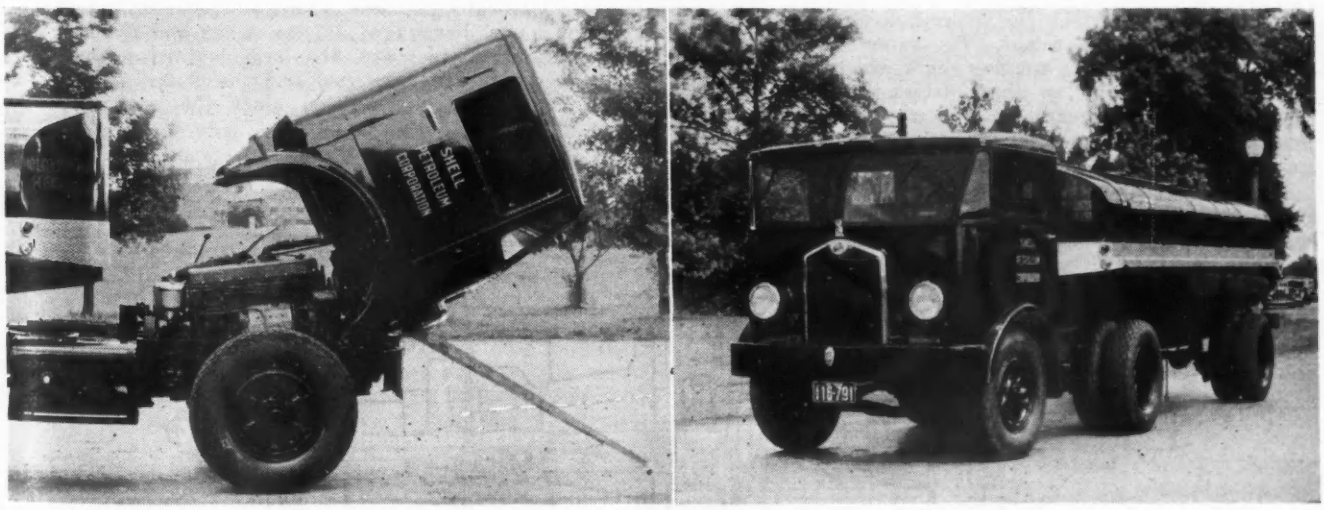
DUE to the extensive use of heat treated aluminum alloy in cab, truck frame, tank and other parts, the total weight of this 3850-gal. tank combination is only 13,450 lb. With load the weight is 37,320 lb.

The overall length of the combination is only 27 ft. while from the ground to the top of the tank is approximately 8 ft. In width, the combination meets the 96-in. limit in effect in most states.

Power is supplied by a 100-hp. Waukesha Diesel which gives a top speed of 50 m.p.h., but speeds will be regulated by means of a tachograph so that a predetermined speed can be set and maintained.

A unique feature of the tractor is the three-point cab mounting. It is hinged at the front and may be tilted forward and put back in place in less than a minute. To tilt the cab, two levers are inserted in pockets in the front of the cab. A locking lever is unlocked at the rear of the cab and a slip sleeve uncouples the steering column. Two men can do the job. With the cab forward, engine and all accessories are readily accessible for repairs or adjustments.

The tractor was built by the Sterling Motor Truck Co., Inc., and the arc-welded aluminum tank by the Heil Co. Fruehauf Trailer Co. built the trailer. The complete job is illustrated below.



Two views of the new Sterling-Fruehauf-Heil tank combination. The overall length of the job is 27 ft. At the left, the cab is shown tilted forward which makes the Waukesha Diesel power plant readily accessible

AUTOMOTIVE ABSTRACTS

Progress of Motor Vehicle Industry in Great Britain

THE work of standardization of British motor vehicle design, which was transferred to the Institution of Automobile Engineers some years ago, has reverted to the Society of Motor Manufacturers and Traders, Ltd., during the past year, one reason for the change being that this work is international in character and therefore necessitates the cooperation of manufacturers who are not always eligible for membership in the Institution, according to *Engineering*. The department has been reorganized under a directing committee with separate technical committees dealing with different matters. These committees also cooperate closely with the appropriate main committees of the Society, particularly in the examination of new legislation.

Starting Devices for Diesels

STARTING of Diesel engines in cold weather is facilitated in German railway service by heating the engines for 30 minutes by steam which is passed through heating coils passing through and around the crankcase. This not only makes it easier to start the engine but also prevents injury to the bearings due to excessive combustion pressures.

Starting Diesel engines by electric starter directly under cold-weather conditions is hard on the starter and battery. Rapid cranking is needed particularly in cold weather, yet the high viscosity of the oil on the cylinder walls, etc., reduces the cranking speed under these conditions. More rapid cranking would be possible by the type of inertia starter widely used on aircraft engines. This, however, would call for a complicated reducing mechanism which makes such starters rather expensive. In motor vehicle starters of the same type more flywheel mass and less gearing would be used.

In the Bosch inertia starter the diameter is purposely kept down to that of the starter motor, hence the flywheel is small and uses a large reduction. The starter pinion is extended in the form of a sleeve which is provided with a steep thread on which the inner hub of the disc clutch can move endwise like a nut. The outer shell of the disc clutch is connected to a tubular shaft which has a splined connection with a hollow shaft driven from the flywheel through a reducing gear. In this way the disc clutch is coupled to the tubular shaft in such a manner that there may be axial motion between the two.

The starter pinion is engaged by means of a lever which at the same time opens the disc clutch, so that the pinion is protected against excessive shock.

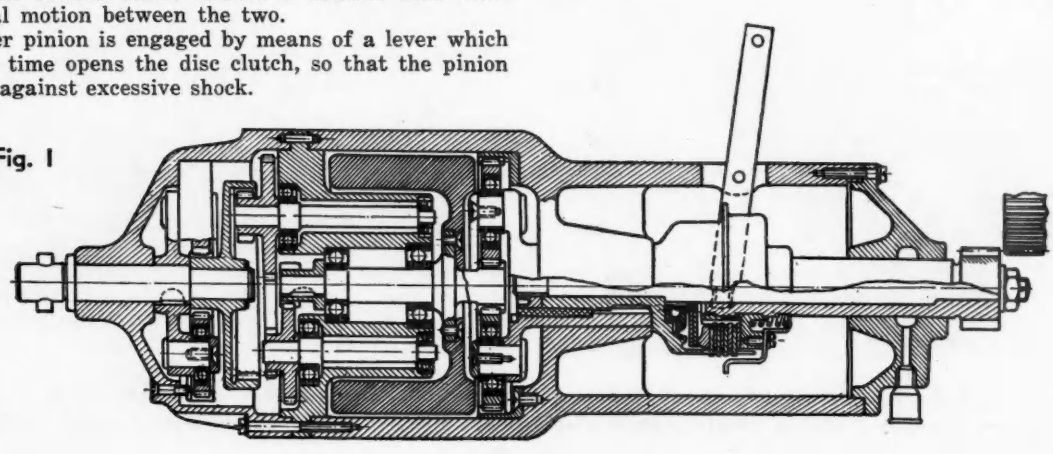


Fig. 1

of hand crank and flywheel; the same gears are used for gearing up to the flywheel and down from it, the design is symmetrical, it has no friction clutch, and it is therefore cheap. Its mode of operation is as follows:

The torque of the hand crank is transmitted through pin *a* to the jaw *b* and from the latter through the two-step gearing to the flywheel, which can be turned up to 2400 r.p.m. To start the engine, one stops turning the crank, so that jaw *b* overruns pin *a* and pushes it to the right through the intermediary of its inclined surfaces, to the stop *c*. This engages the pin *d* at the right end of the hand-crankshaft with the starting clutch jaw of the crankshaft and turns the latter over. After the flywheel has come to rest the spring forces the starting crankshaft back to the left again.

A two-cylinder Deutz tractor engine is started by accelerating by hand a flywheel mounted loosely on the projecting end of the crankshaft. The drive is through a

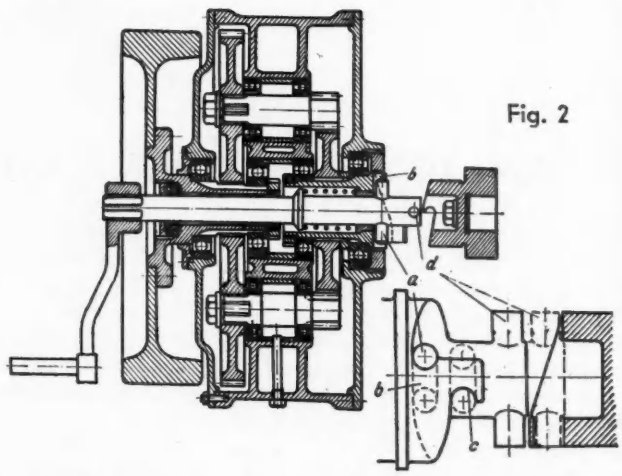
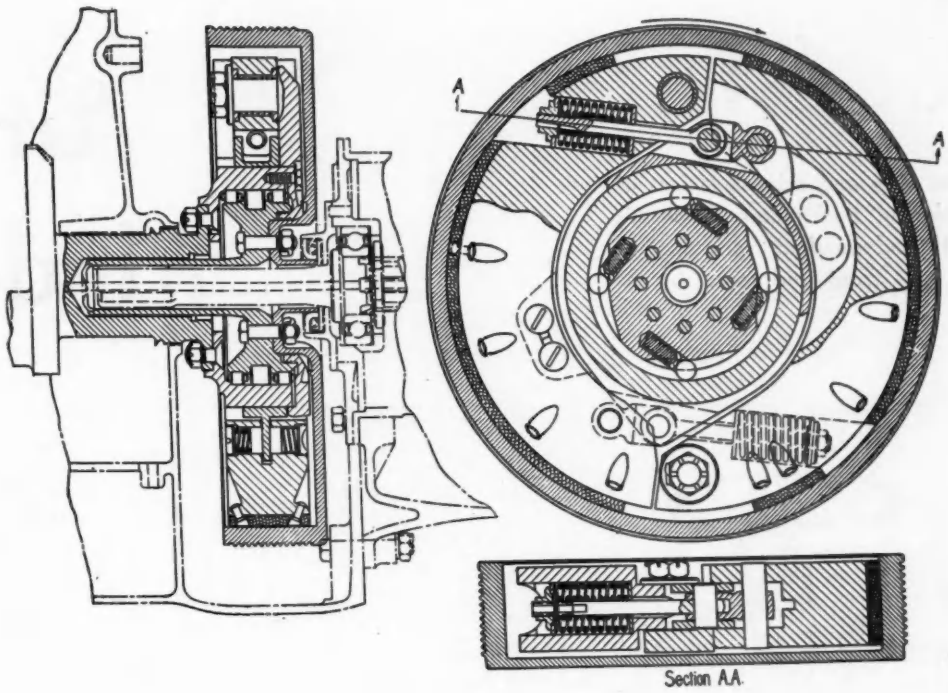


Fig. 2

chain and sprocket and one pair of spur gears. The intermediary shaft carrying the small sprocket and large gear has an eccentric mounting and by turning an engaging lever the gears are brought into mesh and the friction clutch is simultaneously disengaged. Then, when the flywheel has been brought up to speed, the lever is thrown the other way, the gears are unmeshed and the clutch is engaged, which causes the flywheel to start the engine.—*ATZ*, April 10.



Two sectional views of Talbot traffic clutch

Centrifugal Clutch which Permits Engine Braking

A CENTRIFUGAL clutch combined with what may be described as a reversed free wheeling unit is used on some models of the Talbot car. The driven member of the clutch is a drum while the driving member consists of two shoes which can expand into contact with the drum and which are mounted on the end of the crankshaft and form the engine flywheel. Within the clutch is located the free-wheeling unit, the driven race of which is combined with the clutch drum. The drum member is supported on two rows of rollers located on opposite sides of the free-wheel rollers.

The two clutch shoes are pivoted to the back plate at opposite points and in such a manner that there is practically no wrapping effect. The absence of wrapping effect is claimed to prevent grabbing, which is important in view of the effect that the motion of the drum relative to the back plate is counter-clockwise, while the driving member rotates in the clockwise direction.

Near the toe of each shoe is pivoted a link mechanism which connects near the heel of the other shoe through a compression spring. The center of each link is further pivoted to an annulus capable of slight rotation around the outer race of the free wheel. When the centrifugal force on the shoes begins to exceed the spring pressure, owing to increase in engine speed, the shoes contact with the drum and the latter begins to revolve. Since both links are pivoted to the annulus, the motion of the two shoes must be identical in spite of slight differences in the spring pressure, etc. A frictional damping device is arranged to act on the annulus.

The free-wheeling device is so arranged that the drive is transmitted only when the inner race tends to turn clockwise relative to the outer one; that is, when the speed of the gearbox shaft is greater than that of the crankshaft. The clutch shoes begin to move outwardly at 400 r.p.m. and hold firmly at 900 r.p.m. Assuming the car to be stationary, since the inner race of the free-wheeling unit is moving anti-clockwise relative to the outer race, no power will be transmitted by this unit. Between 400 and 900 engine r.p.m. the driving connection is established through the shoes coming into contact with the drum. Within this speed range a certain amount of slippage can take place, but at 900 r.p.m. slippage ceases.

If the throttle is closed when the engine is turning over at any speed above 900 r.p.m., the drive will be in the reverse direction and transmitted to the engine either through the friction clutch or the free wheel. It is thus possible to have all the advantages of a centrifugal clutch and still retain the braking effect of the engine.—*The Automobile Engineer* for May.

Chrome-Plated Cylinders

A DUTCH engineer, Van der Horst, is reported to have invented a process for the chromium-plating of cylinder bores. A heavy coating of pure chromium is deposited electrolytically directly on the cast iron surface of the bore. Several British manufacturers of high-speed Diesel engines are said to have shipped sample blocks to Holland to have the bores plated. By the Van der Horst process a layer of chromium of from 0.004 to 0.006 in. thickness is deposited on the bore and the surface is then polished. The process is said to be quite inexpensive and to cost much less than renewal of liners. It has been noticed also that the chromium prevents the formation of carbon deposits, for which reason the process is being applied also to injection nozzles of Diesel engines.—*L'Officiel de l'Automobile*, June 2.

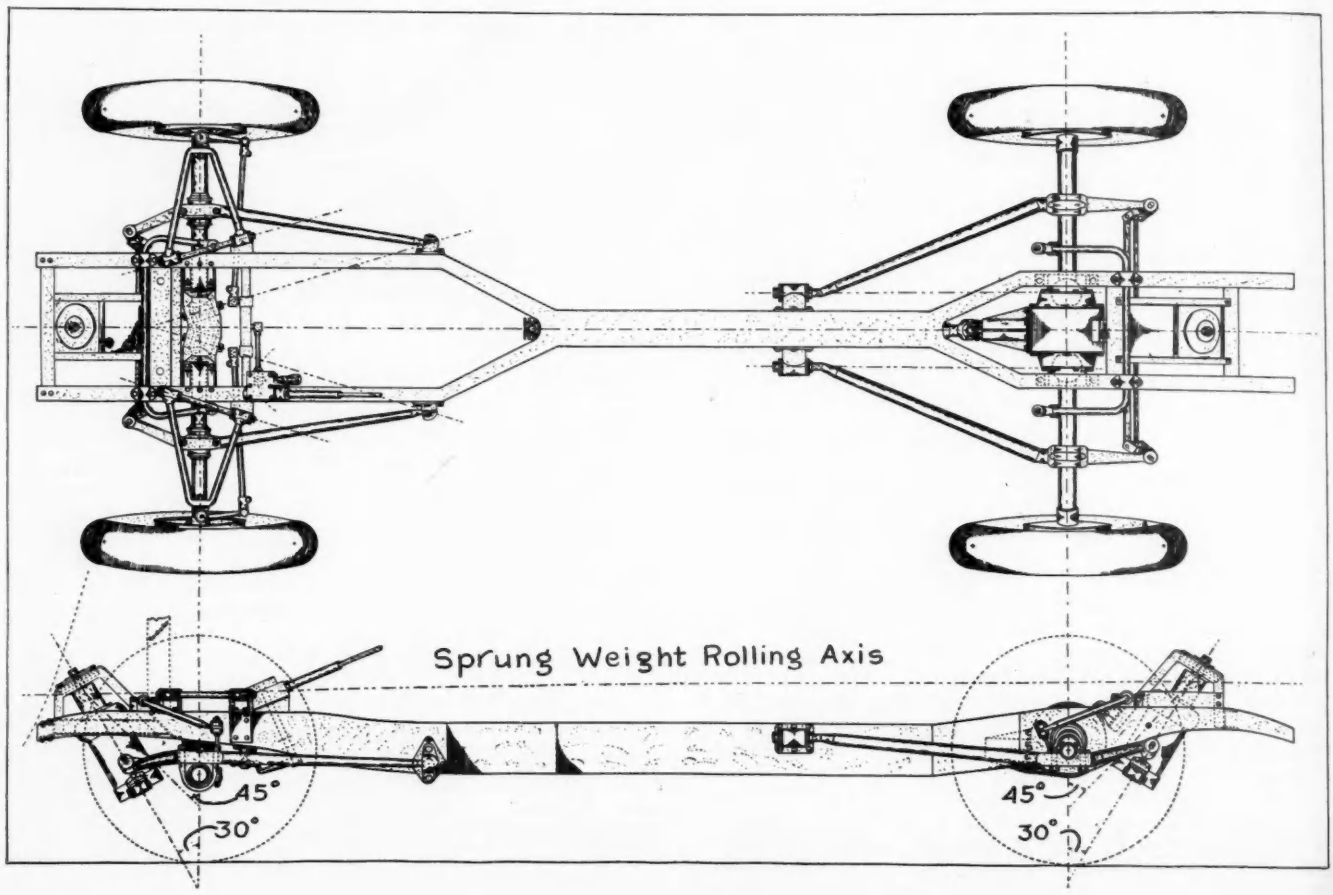
Russian Motor Exports

SOME time ago a sample truck was furnished to the Ankara municipality by the Government Department Autoexport organized recently to handle the sales of Soviet automotive products abroad, and now a sale of 570 trucks and 40 buses is said to have been made to the Turkish Government, delivery of which is to be made in August next. The vehicles are to be produced by the Stalin Works at Moscow, and 117 had already been shipped to Odessa at the time this report was made.

(*Turn to page 152, please*)

Air Springs Independent

Plan view and side elevations of Coleman backbone-type chassis with independent springing at front and rear.



A SYSTEM of independent suspension on air springs combined with a backbone-type frame has been evolved by S. L. C. Coleman of Fredericton, N. B., Canada, and is being demonstrated to car manufacturers in the Detroit area at present.

On the next page is a rear-end elevation. The driving-gear housing is rubber-mounted between the side rails of the frame, and the axle tubes at their inner ends terminate in spheres K and L which are lodged in sockets on the driving gear housing. The chassis frame A is supported at the rear by a single central air cylinder which according to the inventor has a rate of 800 lb. per in. Of course, the rate of an air cylinder is not constant but varies with the position of the movable member, and the rate of 800 lb. evidently refers to the rate under normal static load. However, since the air spring connects to the axle tubes at points substantially midway between the ball joints and the wheels, this makes the rate of the frame suspension 200 lb. per in. In other words, if 200 lb. is added to the load directly over the rear axle, then the frame will drop 1 in.

In order to prevent unpleasant roll when one wheel passes over an obstruction, a torsion bar J, I is provided which is linked to the axle tubes at one quarter the distance from the ball joints to the wheel centers. The chassis frame is freely supported on a longitudinal axis passing through the centers of ball joints on top of the air springs.

Since the rate of the air spring varies with its compression, the length of the stroke has to be restricted. In the present design a drop of 6 in. of the chassis corresponds to a stroke of 3 in. in the air cylinder.

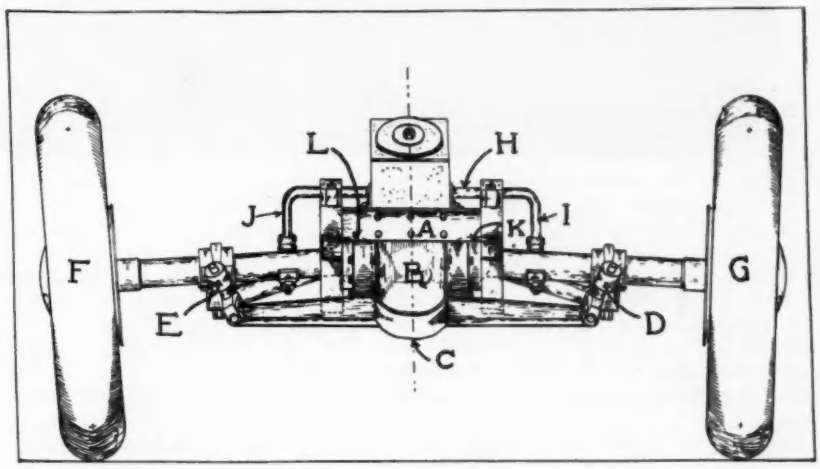
From the chassis side view it will be seen that the air cylinder is mounted at a considerable angle to the vertical. The result is that any given increase in vertical load corresponds to a larger increase in the load along the axis of the air cylinder. With increasing deflection, the angle of the air cylinder axis toward the vertical increases, which means that the load along the cylinder axis increases more rapidly than the vertical load, and this in part compensates for the rapid increase in the rate of the air spring at large deflections.

The air springs are said to be of original design and to comprise a built-

Used in New Suspension

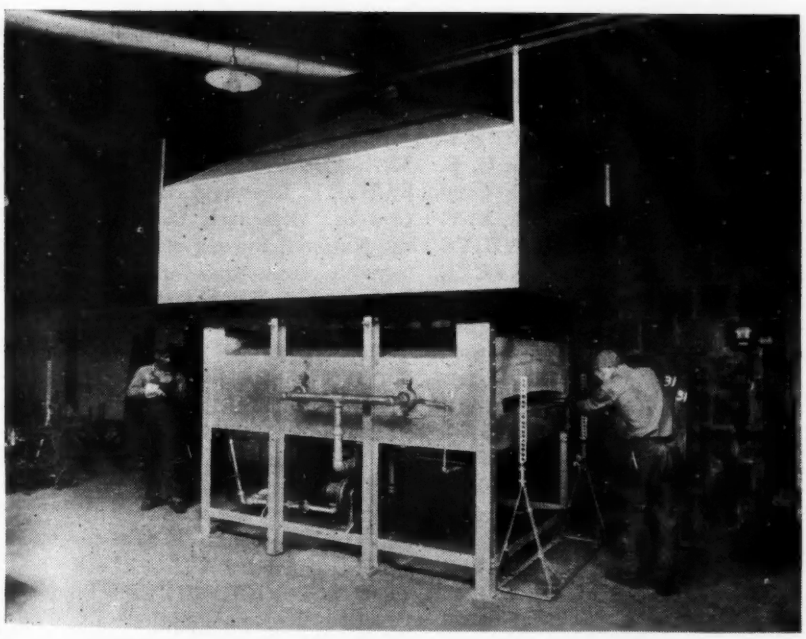
in shock absorber. The axis on which the chassis is mounted on the air springs passes through the center of gravity, hence centrifugal force produces no moments tending to cause sway or roll. While the system of independent springing here described increases the number of articulated joints, most of the joints of this chassis are rubber bushed and are said not to require any attention. The rubber, moreover, has desirable damping effects and prevents the transmission of high-frequency vibrations.

For the backbone-type of chassis frame it is claimed that it can be built 25 per cent lighter than the conventional chassis and is more resistant to torsional moments.



Rear elevation of chassis

Bumper Production

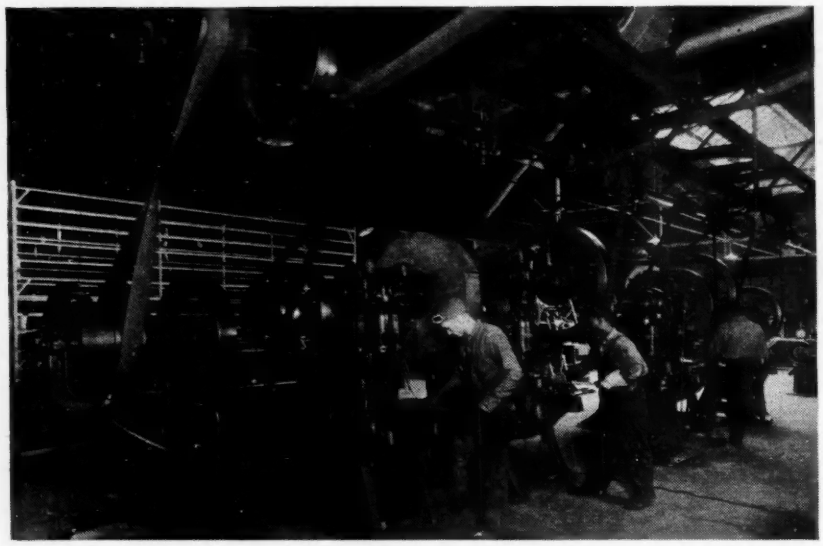


Double forge furnaces showing gas burners and system of firing

by J. B. Nealey
American Gas Association

In the main bumper production line of the Stenger Bumper and Mfg. Co., Detroit, are included shears and ten presses ranging from 25 to 200 tons, used respectively for forming, trimming, piercing, etc. Also there is a double end bulldozer. Stock for these presses is heated in three furnaces. The first of these furnaces, of the slot type, is of refractory and steel construction. Heat is supplied by a nozzle mixing gas burner in each end. The ends of the steel bars are heated here for eye piercing and forming.

The second furnace, in which the bumper stock is heated for its entire length is equipped with a door at each end so that two operators can utilize opposite halves of the furnace for heating stock for their respective presses and bulldozer. Heat is furnished by two gas burners on each side. The



Fabricating steel bumpers

third furnace is similar and has the same capacity. Most of the stock here is of S.A.E. 1095 steel of the following analysis:

Carbon	0.90-1.05
Manganese	0.25-0.50
Phosphorus	0.50
Sulphur	0.080-0.130

This is heated to 1800 deg. F. for forming and is usually hardened on the same heat by quenching in oil. The heat treatment is then concluded by drawing at 900-1250 deg. F. in accordance with the specifications. Some of these are given a special heat treatment which includes reheating after forming and prior to quenching.

A mixture of gas and air is supplied to the burners of each furnace by an air blower and mixer and the piping is unusually simple. The third furnace has two gas burners on each side with a short manifold between and a service line, in U form connecting these two manifolds below. A motor driven mixer with carefully proportioned gas and air inlets, is located beneath the furnace and feeds a combustion mixture directly into the line serving the two manifolds and four burners.

A safety device, in the form of a magnetic shut off valve, is cut into the gas line and is wired in circuit with the motors of the mixer. This valve is kept open against a spring and snaps shut if power to the motor fails. Scaling is kept to a minimum by controlling the furnace atmosphere and fuel consumption amounts to only 2400 cu. ft. of gas per hour which is sufficient to heat 2000 lbs. of steel per hour. A constant supply of hot water is obtained from a gas fired hot water heater equipped with an automatic temperature control.

Bumpers and parts are rotated in tumbling barrels for cleaning and then burnished and polished. Some are painted with black japan and air dried. There is a "drive in" service where car owners can enter to have a bumper repaired or a new one installed. The surplus heat from the furnaces, which are hooded, is carried by blowers throughout the building which is heated in this manner in cold weather. Taken altogether this is one of the most modernly equipped and efficiently operated plants to be found anywhere.

TRADE LITERATURE RECEIVED

REPORT OF COMMITTEE D-2 ON PETROLEUM PRODUCTS AND LUBRICANTS. This report includes a proposed method of test for oxidation number of lubricating oils by the Sligh method, a proposed tentative method of test for flash point by means of the Tag closed tester and a proposed tentative method of test for viscosity by means of the Saybolt viscosimeter.—American Society for Testing Materials, 260 So. Broad Street, Philadelphia, Pa.

CHEMICAL REACTIONS IN THE LEAD STORAGE BATTERY, by George W. Vinal and D. Norman Craig. Research Paper RP 778 of the National Bureau of Standards. Obtainable from the Superintendent of Documents, Washington, D. C. (5 cents).

THE BUNTING BRASS & BRONZE COMPANY, TOLEDO, OHIO.—Circular describing Bunting bronze bars machined and centered and Bunting antifriction metal.

GENERAL ELECTRIC CO., SCHENECTADY, N. Y.—Circular on cable compounds for insulating and sheathing cable.

THE BEHAVIOUR OF WHITE BEARING METALS WHEN SUBJECTED TO VARIOUS DEFORMATION TESTS, published by the U. S. Tin Research and Development Committee, 149 Broadway, New York, N. Y.

THE IMPROVEMENT OF WHITE BEARING METALS FOR SEVERE SERVICE, by D. J. Macnaughtan. Published by the U. S. Tin Research & Development Committee, 149 Broadway, New York, N. Y.

TESTS ON TIN-BASE AND LEAD-BASE BEARING METALS, by C. Jakeman and Guy Barr, D. Sc. Published by the U. S. Tin Research & Development Committee, 149 Broadway, New York, N. Y.

THE FERY-CARBONE DRY-TIN ACCUMULATOR, by Professor C. J. V. Fery. Published by the U. S. Tin Research & Development Committee, 149 Broadway, New York, N. Y.

JIG BUSHINGS, one of a series of standards for small tools and machine tool elements, for sale by the A.S.M.E. Publication Sales Dept., 29 West 39th Street, New York, N. Y.

STANDARD TABLES FOR CHROMEL-ALUMEL THERMOCOUPLES, by Wm. F. Roeser, A. I. Dahl, and G. J. Gowens. Research Paper RP 767 of the National Bureau of Standards. Obtainable from the Superintendent of Documents, Washington, D. C. (5 cents).

METHODS OF TESTING THERMOCOUPLES AND THERMOCOUPLE MATERIALS, by Wm. F. Roeser and H. T. Wensel, Research Paper RP 768 of the National Bureau of Standards. Obtainable from the Superintendent of Documents, Washington, D. C. (5 cents).

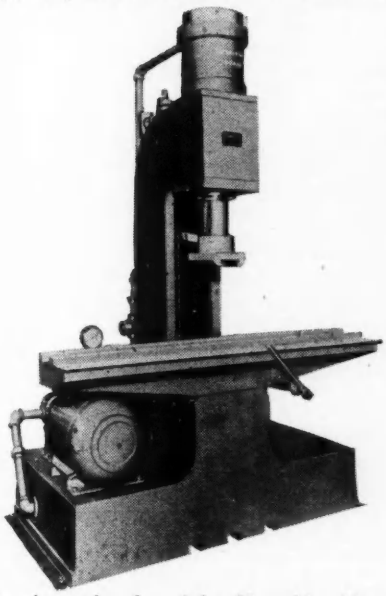
INDUSTRIAL TRUCK AND TRAILER SOLID TIRES. Simplified Practice Recommendation R 103-33. Obtainable from Superintendent of Documents, Washington, D. C. (5 cents).

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Hannifin Sensitive Straightening Press

A 35-ton hydraulic press especially designed for straightening operations on axle shafts, crankshafts, and similar work requiring accurate straightening



has been developed by Hannifin Manufacturing Company, Chicago, Ill.

A single level controls the entire operation of the ram, with a sensitive proportional control action. When the control lever is moved in either direction the ram will move a proportional distance and then stop by automatically bringing the operating valve to neutral. Thus the operator, merely by moving the one operating lever, obtains a ram movement at 35 tons pressure through the exact distance required for the straightening of any piece. An accurate ram movement, either up or down, of as little as 1/16 inch may be obtained.

The hydraulic power unit, with constant delivery type rotary pump, is built into the base of the press making a self-contained unit that requires approximately 19 square feet of floor space.

Ram stroke is 6 inches. Speeds are —power stroke 53 inches per minute— return stroke 77 inches per minute. Dimensions are: table to ram (up) 20 inches, center of ram to face of frame 9 inches, length of table 70 inches, floor to table 36 inches, overall height 98 inches, base 38½x69 inches.

Control for Swivel Table Grinders

Systematic Co., Milwaukee, Wis., tool organization, has announced a new control for swivel table grinders. It is applicable to any plain or universal grinder used for external cylindrical grinding and is of advantage for tool rooms on work with many tapers or where frequent set-ups are required, according to the firm. Installations have been made in a number of the larger Milwaukee shops and plans are under way for national distribution of the product.

New High Speed Automatic Screw Machines

A new line of automatic screw machines, both four and six spindle, has just been announced by The New Britain - Gridley Machine Co., New Britain, Conn. The model 41, illustrated, is a four-spindle type handling work up to 2¼ in. x 6 in. An important new feature of these machines is that the spindles are mounted on preloaded ball bearings, with the aim of preventing radial or axial deflection under the heaviest cuts. Spindles are shorter than the average, and are extra large in diameter to obtain rigidity. The spindle carrier is automatically lifted from its bearing seat just prior to indexing, and held off its seat during the indexing movement, thereby eliminating wear.

Another feature is the use of forming slides mounted on hardened and ground cylindrical steel studs entirely encircled by their bearings, thus providing especially large bearing areas for the cross slides, and tending to preserve the initial accuracy of these slides.

These screw machines are equipped with a spherical roller chuck operating device, consisting of a series of barrel shape d rolls, held in and actuated by hardened and ground high carbon alloy steel actuating sleeves. When the outer sleeve is actuated by the chucking shoe, the barrel shaped rolls are forced radially toward the center of the spindle. This in turn gives axial movement to the chucking tubes.

In order to protect their machines in case of improper lubrication the manufacturers have provided safety oil pressure switches. To start the machine the operator must hold the starting button depressed until the oil gauge shows that the desired pressure has been reached, and if at any time the pressure drops below the predetermined figure, the safety switch shuts off the power.

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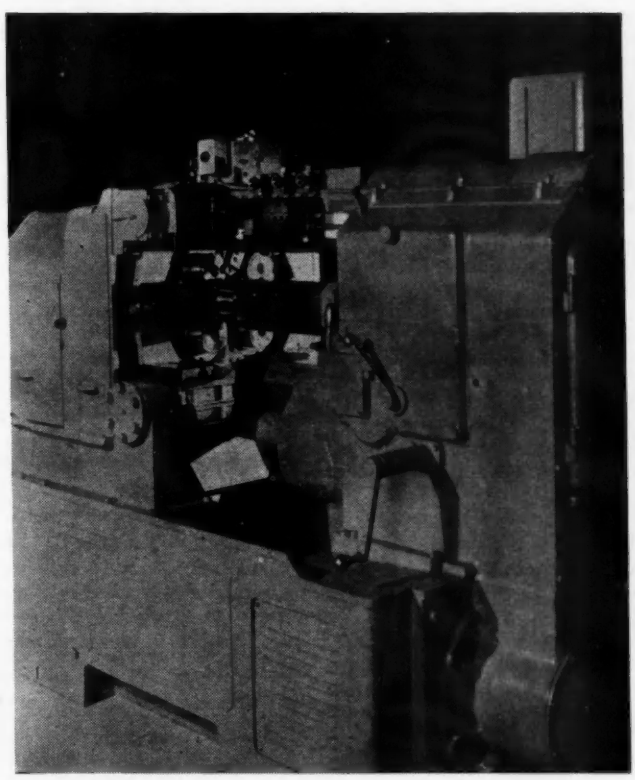


AFL Plans New Member Drive

(Continued from page 125)

pected to send the second largest delegation, Michigan, of course, leading.

The convention will mark the start of an intensive membership drive by the Federation. Its present staff of five organizers is to be materially enlarged. Mr. Dillon said he did not expect an easy task as management is antagonistic to any form of outside union but he felt that the A. F. of L. had more respect than it did a year ago. "We must sell this institution to responsible management," he said. In his opinion there is less unrest among workers than a year ago for which he credited the committees that have been set up in various plants to deal with the managements.

"We are against strikes, as such," Mr. Dillon declared. "They are merely an economic weapon that should be employed only as a last resort. After a strike it is always necessary to get together around the table, and we might as well do it before the strike. Union bargaining committees in plants are functioning better. They are beginning to understand their responsibilities and are less likely to strike than before."

The aim of the new union is the organization of automobile workers and the development of a working agreement with management, not necessarily a written agreement, according to Mr. Dillon. Dues are to be $1 per month per member during the period of employment. Mr. Dillon indicated that the Federation may come to the financial assistance of the new organization until it has built up a reserve fund. The convention is being financed by the A. F. of L., but the expenses of delegates will be borne by the respective locals.

The Detroit office of the Workers' Education Bureau of America is arranging a series of evening meetings for the benefit of delegates and visitors at the convention. They will be addressed by outstanding educators, statesmen and labor leaders. William Green will speak on "The Future of Organized Labor." Among other speakers are William D. Mahon, secretary-treasurer of the Amalgamated Street Railway Men's Association; Hon. John D. Dingell, Detroit; Prof. Max Handman of the University of Michigan and Harry Lynn Pierson of the Michigan PWA.

August May Top 200,000

(Continued from page 125)

ances which have prevailed this summer following removal of code restrictions, but they are still under the April peak.

That the motor companies are well along with the preparatory work on new model programs is indicated by the activity of tool and die shops. The independent shops in the Detroit district are working top speed with day and night shifts general. The peak probably has been reached on die work, but a considerable amount of tool, jig and fixture work is yet to come in. Much has been heard about the changes this year being minor, which may be true for some companies, but the amount of work being done by the independent shops indicates rather extensive changes in some quarters. In fact, demand for skilled tool and die workers is greater than it was in September and October last year, a comparable stage in new model preparation.

The shops are enjoying a very favorable labor situation this year, partly due to the generally high level of wages and partly to lack of organizing activity and agitation. The Mechanics Educational Society, which two years ago was active in organization of tool and die workers, has about faded from the picture. Many of the organizers are back at work in the shops. No unrest is apparent. The men are receiving better treatment generally and the shops themselves have given more attention to protecting themselves from any disturbing elements.

Steel companies report that a substantial amount of tonnage is coming in from the motor companies, of which a large part is on new models. This business has come in about two weeks earlier than was anticipated.

Buick

Increases in both new and used car sales are reported by Buick Motor Co. for the second 10-day period of July over the preceding 10 days. Every section of the country showed a gain. Sales in Eastern states were up 19 per cent; Mid-Western area, 16 per cent; the South, approximately the same; while the Pacific Coast jumped 76.7 per cent. Deliveries for the period totaled 1,978. Used car sales by Buick dealers were up 19 per cent for the country as a whole, with the gain as high as 24.3 per cent in the Middle West.

Chrysler

By July 27 this year, more Chrysler cars had been delivered than in the entire year 1934. This date marked the end of a 30-week period in which Chrysler dealers delivered 123,888 cars, of which 96,505 were Plymouths and 27,383 were Chryslers. Latter figure not only tops the total for 1934 but also that for 1933 and 1932 and shows a gain of 31.3 per cent over corresponding period last year. During week ended July 27, Chrysler dealers delivered 3,421 Plymouths and 909 Chryslers, a total of 4,330 units comparing with 3,384 Plymouths, 935 Chryslers and a total of 4,319 units in preceding week.

DeSoto

New car sales by DeSoto dealers neared the 100,000 unit mark this week to approach an all-time yearly record. In the first 30 weeks this year, DeSoto dealers delivered 95,571 new Plymouth and DeSoto cars, exceeding total deliveries reported for any entire year previous to 1934, and within 6 per cent of deliveries for all of last year. DeSoto sales of 16,608 cars during the period have exceeded DeSoto deliveries for the same period last year by more than 10,000 units, while sales by DeSoto dealers of 78,963 new Plymouths compare with 59,113 units in the same period a year ago.

Dodge

Gains over the preceding week and a year ago are reported by Dodge dealers who, during week ended July 27, delivered 7,745 cars and trucks compared with 7,675 in preceding week and 5,953 in corresponding week of 1934. Of last week's total 4,085 were Dodge passenger cars, 1,048 commercial cars and trucks and 2,612 Plymouths. Used car sales for the week were 8,668 vehicles. Total deliveries by Dodge dealers during the first 30 weeks this year were 222,690 units of which 116,163 were Dodge passenger cars, 31,912 commercial cars and trucks and 74,615 Plymouths. In like period last year Dodge dealers delivered 146,885 units of which 59,657 were Dodges, 26,281 trucks and 60,947 Plymouths. The overall gain is 51.6 per cent while the Dodge passenger car gain is 94.7 per cent or more than double that for all makes in the first half of 1935, when registrations were up 46.85 per cent over the first half of 1934. Factory shipments last week were just about the same as retail deliveries.

Hupp Independent Stockholders Committee

The independent stockholder committee for Hupp Motor Car Corp., which is endeavoring to gain representation for independent stockholders on the Hupp board at the annual meeting Sept. 11, is headed by J. Fred Pierson, former member of the New York Stock Exchange, as chairman. Other members include Roy W. Arnold and Maurice Van Borgh both of New York and Alfred Spear of Providence.

Automotive Leaders on Toledo Peace Board

David H. Goodwillie, executive vice-president of the Libbey-Owens-Ford Glass Co., Harry C. Tillotson, of the Tillotson Manufacturing Co., and Royce G. Martin, president of the Electric Auto-Lite Co., have been named members of the Toledo Industrial Peace Board.

P-A Balance Sheet

Working capital of $1,567,165 is shown on the *pro forma* balance sheet dated June 30, 1935, of the new Pierce-Arrow Motor Corp. This balance sheet gives effect to the reorganization plan.

Current assets, totaling $1,719,048, include cash $772,773, receivables $151,183, and inventories $795,092. Current liabilities total $151,883.

Land is carried at $478,000 and buildings and equipment at $2,027,665. Total assets are $4,399,674.

Securities of the company include 7 per cent preferred stock carried at $250,000, common stock at $594,470, and secured 5 per cent notes of $1,000,000. The balance sheet shows a surplus of $2,349,052, and a reserve of $54,270.

Henry Ford Is 72

Henry Ford observed his seventy-second birthday on Tuesday of this week at his cottage in the Huron Mountain club grounds on Lake Superior.

Hupp Names Officials

Hupp has named George E. Roehm, secretary; Thomas Bradley, director of purchases; Robert L. Hance, director of advertising, and J. F. Bowes, director of service.

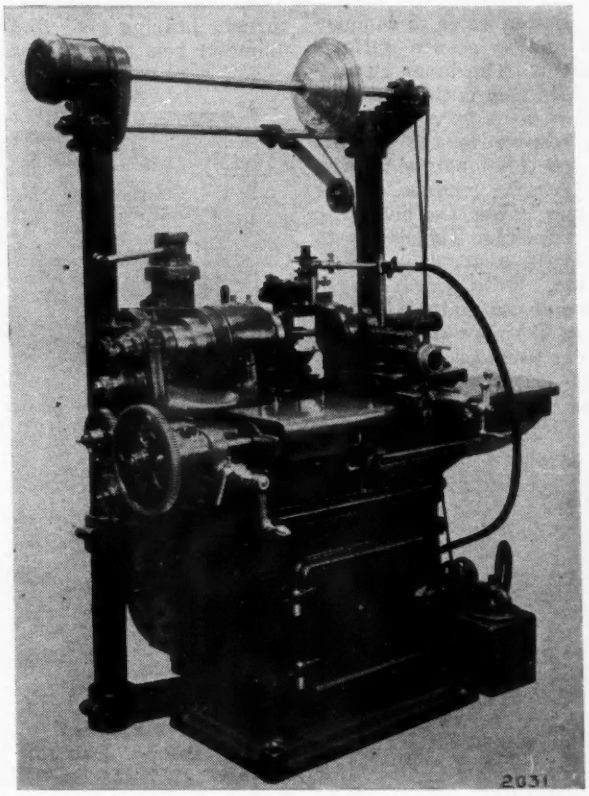
Cleveland Graphite Bronze Co.

A net profit after charges of $936,490 is reported by the Cleveland Graphite Bronze Company for the six months ended June 30.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

(*Continued from page 151*)



Tool Room Thread Grinder

Societe Genevoise D'Instruments has placed on the market a tool room thread grinding machine, through its American sales agents, the Triplex Machine Tool Co., New York, N. Y.

The machine is driven by a 2 hp. motor mounted at the rear of the bed, and the drive then extends to a backshaft and from there to the cone pulley on the machine. This gives six workhead speeds. Eight wheel spindle speeds are obtained by means of a grooved pulley on the shaft shown overhead, driven by a 1 hp. motor.

The machine has a master leadscrew which, protected from grinding dust and dirt, permits of an accuracy of leadscrews to plus or minus 0.0001 in. The leadscrew has a correcting device at the front. A vertical microscope is fitted over the top of the wheel to provide a means for controlling the profile angle of the wheel and of the workpiece during the grinding process. The grinding wheel head can be tilted to any suitable angle of helix formed by the threads to be ground.

This machine can be used for grinding male threads from 3/16 in. to 6 in. in diameter and up to 12 in. in length between centers. For female threads, the grinding capacity is from 1¼ in. to 5 in. inside diameter. A corrector for temperature is also furnished to take care of variations in temperature from 32 deg. to 68 deg. Fahr.

A New Sleeve Type Clutch

Niagara Machine & Tool Works, Buffalo, N. Y., announces a new fourteen point engagement sleeve type clutch for machine tools. Prolonged life, instant engagement, increased number of strokes per minute and added safety are features of this clutch.

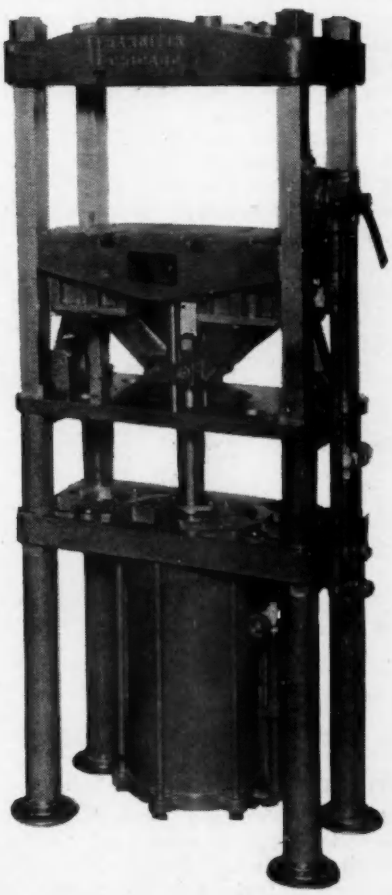
The fourteen engaging jaws contribute to long life by distributing the load over a striking surface having many times the usual area. The time lag between depressing the treadle and actual clutch engagement is practically eliminated. This contributes to increased production, and safety.

The crankshaft may be arranged to stop at, before, or after the top-center position by mounting the clutch sleeve in the corresponding radial position. Twenty-six splines provide twenty-six possible positions. When the treadle is depressed, a large concentric spring slides the clutch sleeve into engagement. At the end of the stroke, the sleeve is positively withdrawn by a cam race machined in the sleeve, which is engaged by hardened alloy steel follower spindle, mounted in long antifriction bearings.

Hannifin Air Operated Moulding Press

A compact 15-18 ton capacity air operated platen press for plastics and rubber molding operations is announced by Hannifin Manufacturing Company, Chicago, Ill. The design of this new press provides an advance stroke at six times the speed of the pressing stroke. The advance stroke is 5½ inches at 6,000 lbs. pressure and the pressing stroke 1½ inches at 30,000 lbs. This cycle of operation permits rapid production, and one operator easily handles the steady production of several presses.

The press is being used for both hot and cold molding, rubber molding, and several types of special molding operations. Speeds and pressures may be regulated to suit individual require-



NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

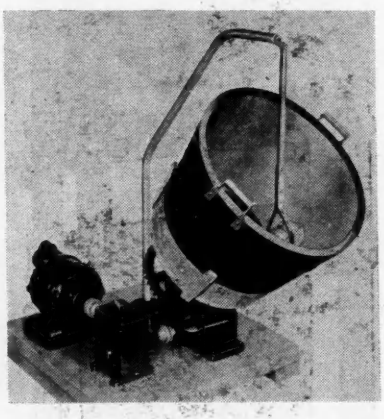
ments of any particular molding work. An especially valuable feature of this press in plastic molding is the provision for the use of maximum pressure to "break" or separate the molds on the reverse stroke after the pressing operation is completed. An air cushion at the end of the stroke prevents shock.

Platen is 17x14 in. between columns, 22 in., daylight, platen down 17½ inches, platen up 10½ inches. Advance stroke is 5½ inches at 6,000 lbs., power stroke 1½ inches at 30,000 lbs. Advance speed is six times the pressing speed. Cushioned reversal at full power is provided for separating molds upon completion of the molding period.

Low Cost Plating Unit

In response to the demand for a small, low-cost barrel plating unit. The Udylite Co., Detroit, Mich., has brought out the Handiplater, an electroplating barrel with a detachable cylinder. This feature makes it possible to plate cadmium, copper, nickel, tin, and zinc; dry and tumble with just one machine.

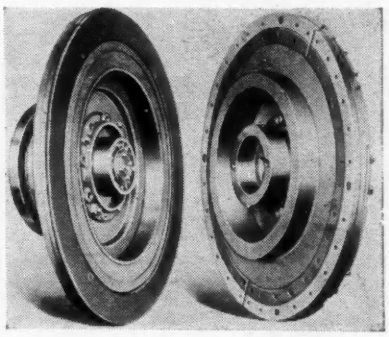
The unit has a capacity up to 25 lb. and is intended for production plating of small parts as well as occasional batches. It is motor driven by a 1/6 hp. motor.



New Features in Magnetic Clutch

A newly designed general purpose magnetic clutch is announced by Cutler-Hammer, Inc., Milwaukee, Wis. An outstanding feature is the method of adjusting the friction faces to compensate for wear and to assure uniform lining engagement. The inner circumference of the field ring is threaded and the adjustment is made by rotating the field ring, in respect to the magnet field member, and consequently moving it toward the friction surface on the armature member. When the field ring has been moved forward sufficiently to compensate for the wear, it is locked firmly in position.

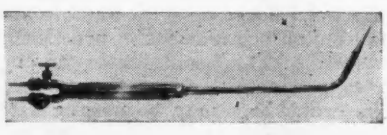
A floating magnet armature is used in the design of the new clutch, making it impossible to score the magnet pole faces even if proper adjustment on the lining is not maintained.



New General Duty Welding Torch

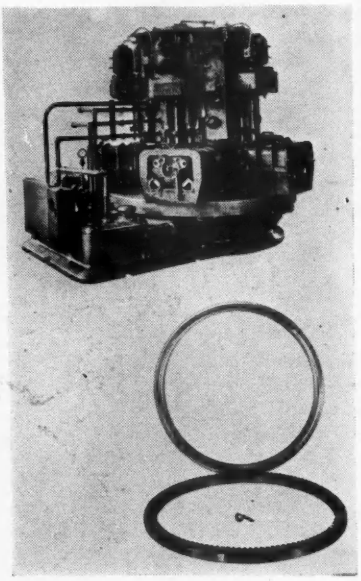
The Purox No. 35 General Duty Welding Torch just announced by The Linde Air Products Company, New York, N. Y., embodies refinements in design and operation that are said to make it outstanding among medium pressure torches. Constructed of extruded brass, Monel metal, and drawn copper, and with silver soldered tubes, this torch is rugged and can stand rough treatment. Its range of usefulness makes it equally adaptable to the lightest as well as the heaviest work to be found in any welding shop. It is listed by Underwriters' Laboratories, Inc.

The connections are ferrule type and extend parallel to the axis of the handle. The individual mixers in each welding head are so designed that maximum resistance to flashback is afforded and at the same time the effective range of each size tip is greatly increased. Nine tips perform the duty of 15, the number usually required. The Monel metal seating surfaces are protected, wear-resistant, and easily removable for cleaning or replacement.



Ball Thrust Bearing Of Unusual Diameter

An interesting installation of a ball thrust bearing of unusually large diameter held to very close limits for a high precision application is illustrated in this special Bantam ball thrust bearing. It is 54 in. O.D. x 48 in. I.D. x 4½ in. thick and was built by the Bantam Ball Bearing Company, South Bend, Indiana, for the Hammond Manufacturing Co., Cleveland, Ohio, for use on the special automatic multi-operation boring and reaming machine.



The machine was designed to finish four boring and reaming operations on the pump connections of the motor on a popular low priced automobile. The equipment is so constructed that each boring operation is held within limits of one thousandth of an inch, and timed to produce one finished motor block every 40 seconds, four operations being handled at one time. All tools are driven by individual motors, while the feed and quick return are operated hydraulically. The table is also rotated hydraulically

The 95 in. diameter table which carries the jigs and engine blocks is supported and rotated on the Bantam ball thrust bearing. The table is indexed for 72 degree movement which takes care of one loading station and four machining operations. The machine is very compact, requiring a floor space of only 8 ft. by 12 ft., and is 9 ft. high from the floor to the top of the center column.